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SODIUM SALTS OF IODOSOBENZOIC AND IODOXYBENZOIC ACIDS IN DISEASES OF BACTERIAL ORIGIN*

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NEW YORK

In 1892, Meyer[1] described three acids (oxygen and iodine combinations of benzoic acid) which have interesting therapeutic possibilities. The three acids differ one from the other in their oxygen content. The experiments here reported have to do with sodium salts of two of the acids, iodosobenzoic and iodoxybenzoic.

Loevenhardt[2,3] and his co-workers have described the effects of these acids on the oxidative processes of the body and have reported improved methods of manufacture. The acids are insoluble in water, but the sodium salts are freely soluble and have the same properties as the acids. Both the salts are powerful stimulants to oxidation, and because of the amount of oxygen contained, large doses are sometimes followed by periods of apnea. Intravenous injection is occasionally followed by a drop in blood pressure. However, neither the apnea nor the fall in blood pressure is ever serious. Subcutaneous injection of improperly prepared solutions may be followed by local necrosis, and repeated large doses given intravenously may give rise to considerable destruction of the red blood cells. While iodine is demonstrable in the urine in small amounts within one hour after injection, not all the iodine in the preparation can thus be accounted for, as most of it apparently combines with the tissue cells.

In the cat an intravenous dose of 0.06 gm. per kilogram has not produced any untoward result, while 0.045 gm. per kilogram in a rabbit has not produced toxic symptoms. The repeated injection of 0.01 gm. per kilogram in man has not produced any toxic effect unless the solution was improperly buffered, when a chill after injection may occur. We have given this dose in one patient on twelve successive days without noting bad effects.

Hektoen[4] has reported that a single injection of sodium iodoxybenzoate will increase the strength of a specific antibody from twelve to sixty times over that of control animals. Bunting has recorded a marked stimulation of leucocytes following a single injection. Arkin[5] found that a two thousandth-normal solution would kill Bacillus typhosus in twenty-four hours, and that this bactericidal action was not inhibited by the presence of protein. The drug is therefore exceptional in that it is not only bactericidal but also a stimulator of antibody formation, such a combination being ideal.

The present experiments are an amplification of the results which have previously been recorded by others.

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PREPARATION OF SODIUM SALTS

The iodoso salt is made by placing 1 gm. of the acid in a volumetric flask, adding 5 c.c. of a 10 per cent solution of sodium hydrate, shaking well and slowly adding distilled water up to 100 c.c. The iodoxy salt is prepared in the same manner except that but 4 c.c. of a 10 per cent solution of sodium hydrate is employed. The solutions need not be sterilized for they sterilize themselves.

The sodium salts have a taste similar to that of hydrogen peroxide. They do not stain or irritate the tissues. They have a slippery feel. These characteristics apply only to the concentrated solutions whose preparations have been described. For actual application, the stock solutions are much diluted.

A series of culture tubes containing definite amounts of a twenty-four hour culture of the organism to be tested were set up and to each tube was added a predetermined amount of either sodium iodosobenzoate or iodoxybenzoate. At various intervals up to forty-eight hours, subcultures were made from these tubes to determine the lethal point of definite dilutions. The organisms tested were Bacillus typhosus, Streptococcus hemolyticus and Staphylococcus aureus.

The data are presented in the accompanying table.

Organism	Sodium Iodosobenzoate		Sodium Iodoxybenzoate	
	Lethal Point, Hours	Dilution	Lethal Point, Hours	Dilution
B. typhosus....	24	1:5,000	24	1:2,000
	48	1:5,000	48	1:5,000
Staphylococcus.	24	1:500	24	1:200
	48	1:1,000	48	1:1,000
Streptococcus..	24	1:1,000	24	1:500
	48	1:2,000	48	1:1,000

As bacteriological controls a series of culture tubes containing definite amounts of a twenty-four hour culture of the organism to be tested were set up. To these tubes were added varying amounts of a solution of physiological saline to which had been added sodium hydrate in sufficient amount to give a pH of 9.6. The bulk added to each tube was the equivalent of the bulk of the sodium salt solution added to the actual test. After varying periods of time subcultures were made and no inhibition of bacterial activity was demonstrable in any dilution. The bactericidal action observed, therefore, can be attributed to the action of the sodium salt employed.

A series of rabbits was injected with sheep corpuscles after the manner of preparation of amboceptor. The sheep corpuscles were injected at three day intervals in dosage of 0.05, 1 and 2 c.c. of 50 per cent suspension. Half the group received an intravenous injection of 1 c.c. of 0.5 per cent sodium iodoxybenzoate solution. After three weeks the animals were killed. The hemolytic titers of the non-injected animals were 1:500, 1:800 and 1:1400, while the animals injected with the iodoxybenzoate gave titers of 1:1000, 1:7000 and 1:10,000.

Another series of animals injected with sodium iodosobenzoate did not show any increase in lytic titer over the controls.

The lethal action of the two salts apparently varies; both are more lethal for typhoid than for staphylococcus or streptococcus, while in general iodoso is the most bactericidal. The iodoxy salt is the one that increases antibody formation.

Loevenhardt has used sodium iodoxybenzoate in the treatment of chronic arthritis and more recently others have also reported on its use in this condition. Loevenhardt found that 50 c.c. of a twentieth-normal solution was followed by a chill and a rise in temperature, subsequent to which the arthritic symptoms improved markedly. We have given 100 c.c. of a twentieth-normal solution and did not have any reaction. Loevenhardt has also expressed the thought that it might not be advisable to use strong solutions in treatment because of the possibility of causing a sudden mobilization of the

defensive forces of the body, which, plus the bactericidal action of the drug, might result in the sudden death of large numbers of the disease-producing bacteria with the liberation of large amounts of toxin. This view is apparently borne out by the results obtained in the following experiment:

A number of rabbits were injected with 1 c.c. of a twenty-four hour broth culture of pneumococcus, type 2. The strain was isolated from a fatal case in man. Of the control non-treated animals, nine died within twenty hours, three within twenty-four hours, and one within thirty-six hours of infection. The treated animals were given 1 c.c. of the iodoxy salt one hour after infection and daily thereafter; five lived for forty-eight hours, three for ninety-six hours, and one for one hundred and ten hours.

In a second series, 0.5 c.c. of a twenty-four hour culture was injected. The treated animals of this group received 5 c.c. of a 2 per cent solution of the iodoxy salt subcutaneously within one hour after the infection and daily thereafter. Of the control group, one lived three days; three lived four days; one lived five days, and seven lived more than three months. Of the treated, one lived one day; three lived three days; three lived four days; three lived five days, and three lived more than three months. In this group, treatment evidently increased the mortality.

In a third series the infecting dose was 1 c.c. of a twenty-four hour culture, and the treatment dose given as before was 0.5 c.c. of a 1 per cent solution of the iodoxy salt. Three controls died within forty-six hours, while one treated animal died in seventy-two hours, the other two surviving more than three months.

In a further series of experiments, guinea pigs were injected with the tubercle bacillus, the infecting dose being approximately 1 mg. of moist human tubercle bacilli. The treatment dose was 1 c.c. of a 1 per cent solution of slightly alkaline iodoxybenzoate to each 300 gm. of weight, injections being made subcutaneously. The treatment commenced fourteen days after infection.

Of the control animals, all died with advanced tuberculosis within three months of infection. Of the treated animals, twelve died within three months of advanced tuberculosis; five animals survived until six months after infection and showed many areas within the peritoneum in which recession or partial healing was taking place, and seven animals were alive eight months after infection and had gained weight.

Enough has been cited of the animal experiments to warrant the statement that further work in the application of these drugs seems indicated. Such work must take into consideration the fact that each organism will probably have a different dosage for maximum results. We have not had the opportunity to make an investigation of the therapeutic effect in typhoid, but the strong bactericidal action on this organism is suggestive that it may be of value.

The investigations were next transferred to the treatment of various types of infection in man. Two per cent stock solutions of the sodium salts of the two acids were prepared. They were not boiled. For use, the stock solutions were diluted from ten to forty times with tap water, permitted to stand for several hours and then applied therapeutically.

The results observed are best summarized in the words of the various surgeons employing the solution. Dr. J. J. Asch reported that in gonococcus infection of the genital organs the solution (iodoso) was without value in that gonococci were not caused to disappear from the discharges when the solution was used in strengths as concentrated as 1:1000. The solutions were said to be non-irritating and non-staining.

In mouth infections about the teeth with Vincent Plaut organisms, strengths of from 1:1000 to 1:2000 (iodoso) cured the condition notably in recurrent cases in which arsenicals and other antiseptics had

failed. The solutions were reported by Dr. S. W. Franken as somewhat slower in action but surer and cleaner than other antiseptics.

In the surgical services the iodoso solution was used on open wounds to which wet dressings would ordinarily have been applied. The solutions were employed in a strength of 1:20,000. The following opinion expressed by the observer, Dr. Carl Eggers, is based on clinical investigations, for bacteriologic controls were not used:

> In a general way it may be said that we were very favorably impressed with it. It acted equally well regardless of the organisms responsible for the infection. There were no constitutional symptoms referable to its use, and no untoward local reactions. There was at no time irritation of the tissue or the surrounding skin, nor did the patients complain of burning or pain following its use.
>
> It was particularly noted that the solution seemed to clean up wounds more quickly than is usually the case. Old granulating wounds with suppurative discharge which were being prepared for skin grafting were cleared up and made ready in a few days. The sluggish wounds on amputation stumps in thromboangiitis obliterans cases improved and showed red granulations in a shorter time than usual. Sloughing wounds, such as carbuncles, cleared up more rapidly and the odor was less. The important thing was to bring the solution into contact with all parts of the wound.
>
> It may therefore be stated that the solution fulfils all the requirements of a wet dressing and has the advantage that it cleans wounds up more quickly than the other antiseptics at present in use.

One of us (G. L. R.) has used the iodoxy salt in five cases of Streptococcus sepsis in dosage of 2 c.c., given every twelve hours intravenously. All these patients were practically moribund before receiving the first injection, and all died within forty-eight hours after the first dose. In another case of Streptococcus viridans infection, a total of 200 c.c. of the iodoxy salt was given intravenously during a period of twelve days without affecting the usual course of the disease.

In one case of hemolytic streptococcus blood infection resulting from a carbuncle, five injections (iodoso) were given at twelve hour intervals, the dose being 2 c.c. The blood became sterile on the fourth day after injections were started, and the patient recovered. This case is recorded without further comment since we have observed similar occurrences on three other occasions, in which, supposedly, specific bactericidal medication was not given intravenously.

CONCLUSIONS

Experiments thus far recorded show that the sodium salts of iodoso and iodoxybenzoic acid have interesting therapeutic possibilities. Our data confirm the work of others, showing that these agents are both bactericidal and stimulators of antibody formation. It has been found possible to use them in diseased conditions in man. We would urge further clinical study of the problem by those having the opportunity to carry out the experiments.

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EXTRAPERITONEAL URETEROVESICOSTOMY

BY A SIMPLIFIED TECHNIQUE FOR POSTOPERATIVE URETERO-ABDOMINAL FISTULA*

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THE following method is suggested as a simple and safe procedure for reimplanting into the bladder the ureter which has been divided accidentally during the course of a hysterectomy or similar pelvic operation. After the usual preoperative preparation, the bladder is distended to its full capacity, the fistula is packed with gauze and a pararectus incision is made with a hockey stick extension at the lower angle toward the fistula, with an elliptical excision of its mouth. After ligating and dividing the deep epigastric vessels, the parietal peritoneum is stripped away from the lateral and posterior abdominal wall in the usual manner and the ureter is exposed and

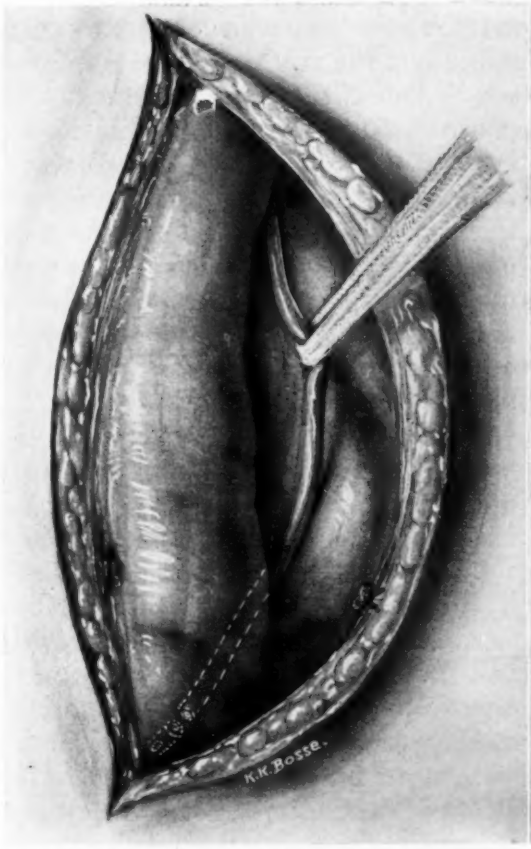

Fig. 1. Shows the ligation of the epigastric vessels, the stripping off of the parietal peritoneum from the lateral and posterior abdominal wall and the freeing of the ureter.

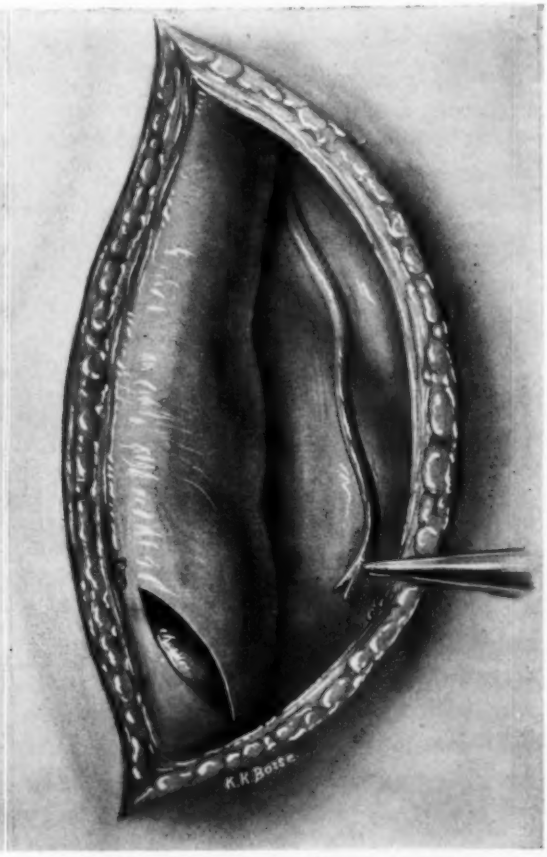

Fig. 2. Shows further mobilization of the ureter with the end freed and with lateral slits made, creating an anterior and a posterior ureteral flap. Shows also the incision of the peritoneum at the lower angle of the wound, exposing the lateral portion of the fundus of the bladder.

* From the Surgical Service of the Lenox Hill Hospital.

identified. The ureter is then freely separated from the parietal peritoneum to which it is adherent down to its point of

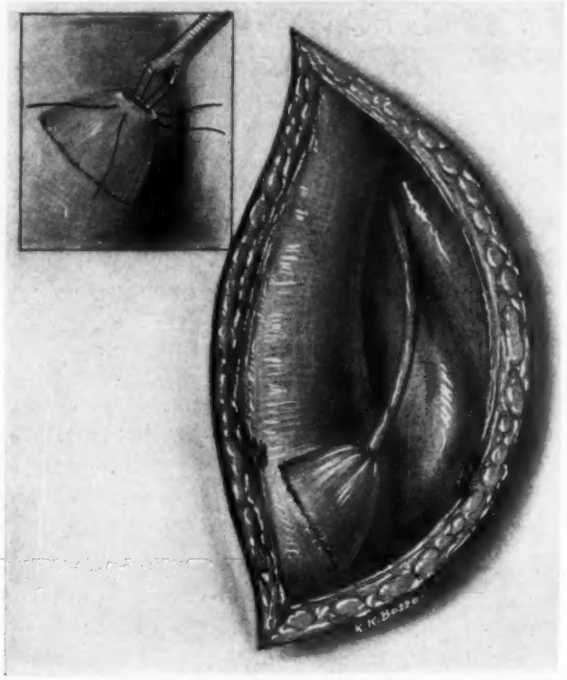

Fig. 3. Shows the continuous circular suture of the parietal peritoneum to the peritoneum-covered lateral tongue of the fundus of the bladder, extraperitonealizing same, and the implantation and invagination of the mobilized ureter into the apex of this tongue. Insert shows the opening in the extraperitonealized tongue of the bladder and the mattress sutures through the anterior and posterior ureteral flaps going through the bladder wall for purposes of implantation.

fixation in the pelvic pocket, and a tape is slung around it for retraction (Fig. 1). The end of the ureter is then completely loosened from the pelvic pocket and, if diseased, is amputated. If necessary the ureter is further mobilized, even as far as the kidney pelvis, so that the end can easily be brought down without tension almost to the symphysis. The peritoneum is then deliberately opened at the lower angle of the wound and a peritoneum-covered tongue of bladder from the side of the fundus is drawn through the peritoneal opening (Fig. 2). This portion of the bladder is then extraperitonealized by a continuous circular catgut suture of parietal peritoneum to the peritoneum-covered bladder wall (Fig. 3). Two small lateral slits are then made in the end of the ureter, creating an anterior and a posterior flap. A puncture wound is then made in the bladder and ureterovesicostomy is then performed by means of two fine chromicized catgut mattress sutures through the bladder wall and the anterior and posterior ureteral flaps, implanting the ureter into the bladder (Fig. 3, insert). A double circular row of interrupted chromicized catgut sutures, between the peritoneum of the bladder wall and the ureter, can then be inserted further invaginating the ureter into the bladder and reinforcing the implantation. An extremely satisfactory anastomosis can thus be made without tension. The suprapubic fistula, which should be entirely ignored up to this point, is then curetted. Suitable drainage is instituted through the fistulous tract and through the lower angle of the incision to the pelvic pocket, and also through the upper angle of the incision to the retroperitoneal space toward the lower pole of the kidney. The abdominal wound is closed in the usual manner by fascial and skin sutures.

This operation was carried out by the writer in a case of left-sided ureteroabdominal fistula which developed following a hysterectomy for fibromyomas of the uterus performed by another surgeon. The patient's convalescence was quite uneventful, and for a time it seemed as if the procedure would be successful, as there was no urinary leakage until about twelve days after the operation. Unfortunately a subsequent nephrectomy became necessary, when an extensive pyonephrosis was found. The infection of the kidney was probably the cause of the failure of the anastomosis. In spite of this failure, however, it seems that the operation suggested might be useful if performed early enough, before the kidney becomes infected. It certainly disposes of the danger of peritonitis from leakage at the anastomosis and does away with the objectionable transversing of the peritoneal cavity by the ureter, which may act as a band and produce a secondary intestinal obstruction.

AN IMPROVED
COLOSTOMY SPUR CRUSHER*

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IT is generally conceded that the easiest, safest, and altogether most satisfactory method of closing the usual and most approved form of a deliberate colostomy, and also that type resulting from the Mikulicz "Vorlagerung" operation, namely, one in which a spur has been formed, is by first cutting through the spur with some form of crushing instrument. After this has been done the colostomy occasionally closes spontaneously, but even if this does not occur, the eventual closure by separating the intestine from the skin and suture, often possible by an extraperitoneal technique, is a very simple procedure. Almost the only instrument that has been available for this purpose is the rather unsatisfactory Mikulicz "Spornquetsche," a scissors-like instrument with separable blades, fitting together by means of a French type of lock, and with several sharp prongs on the intraintestinal portions of the blades to catch in the mucous membrane of the gut so as to prevent slipping. The crushing of the spur is produced by pressure made by a rubber band around the handles. This instrument is most inefficient and often fails to function because of the scissors type of action and because the pressure cannot be controlled. Then the sharp prongs are an undoubted menace as they can easily perforate the intraperitoneal portion of the gut. As a matter of practical experience, this instrument must often be reapplied several times before the spur is cut through satisfactorily. Further, it not infrequently causes marked peritoneal irritation with pain, distention, even vomiting, and sometimes fever, so that occasionally it must be removed and later replaced. Aside from the Mikulicz "Spornquetsche" the only other instrument that has hitherto been used has been some form of large artery clamp. This again is neither quite safe nor certain, as it also closes by a scissors action and does not permit of gradual pressure, and further, the crushing surface is too narrow.

An instrument has been devised to overcome these disadvantages (Fig. 1). It consists of a strong, heavy, two-bladed clamp, with an intraintestinal portion and handle. The blades are entirely separable so that they can be introduced into each loop of the colostomy separately. They come together on two plain transverse cylindrical bars at each end of the handle and on a partially threaded bar running in the opposite direction through the center of the handle. The lowest transverse bar also acts as a support for gauze padding to prevent dragging or tilting of the clamp after it has been placed in position and locked there. The closure is perfectly parallel so that the pressure on all parts of the spur is always equal. The intraintestinal portion of the blade is 2¾ inches long and ¼ inches broad. Its surface is ridged and grooved with exactly interlocking, rather high ridges and deep grooves, running in a longitudinal direction to prevent lateral slipping, except for ⅜ inches at the tip, where it is similarly ridged and grooved transversely to prevent the clamp from coming out. The ridges, tips and edges of the blades are all very carefully rounded off to prevent cutting the intestine and possible perforation into the free peritoneal cavity. This has been done particularly at the inner sides of the tips so that there is a definite v-shaped defect between the ends of the blades. The blades are closed and pressure

* From the Surgical Service of the Lenox Hill Hospital.

made by means of a round set screw controlled by a second winged lock screw attached to the partially threaded bar

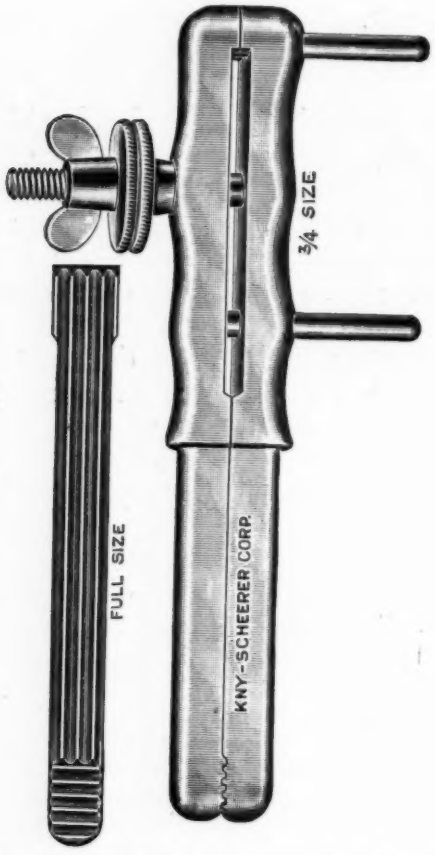

Fig. 1. Improved colostomy spur crusher. Instrument shown closed. Insert shows surface of intraintestinal portion of blade.

which runs through the center of the handle.

After the patient has been given a thorough catharsis and the lower loop well cleansed by irrigation, the blades are separately introduced into the loops of the colostomy as far as the handles which protrude beyond the gut. They are then brought together on the bars and locked in proper position by turning the set screw down until the first resistance is felt and then the set screw is held in this position by tightening the lock screw until it catches on the former (Fig. 2). The crushing can then be done as rapidly or as gradually as desired.

Usually it will be found that every day the set screw has loosened and can be given from ½ to 2 turns without difficulty and

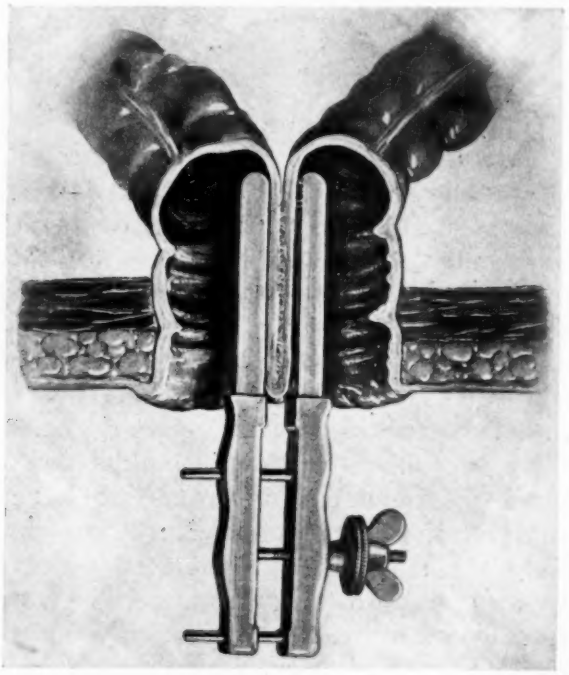

Fig. 2. Illustration showing colostomy spur crusher in action with the blades partially closed.

without encountering much resistance. This screw should be turned daily until the resistance is met and then locked in place by the lock screw. As a rule, it takes from five to seven days to cut through a spur without discomfort and without risk. If the spur is exceptionally thick it may take a day or two longer. The patient exhibits practically no symptoms if the clamp has been properly applied and is properly manipulated. It can be seen that the intraintestinal portion of the clamp is completely closed by noting that the ends of the handle are in apposition and that the set screw can no longer be turned. When this has been accomplished the clamp comes away within a short time and the spur has been broadly and thoroughly divided. I have been using this clamp with complete success for the past nine years, as have also a number of my surgical colleagues here in New York.

ACUTE GANGRENOUS APPENDICITIS

PERITONEAL SEPSIS WITH HYPERPYREXIA. RECOVERY*

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SURGEONS agree that the chapter on operations for acute appendicitis furnishes the most remarkable kaleidoscopic picture of pathology seen in vivo, and this refers not only to the findings at operation, but also to those in the course of the after treatment.

A recent personal experience with pronounced postoperative hyperpyrexia in a child, never seen by me in such a degree before, with favorable outcome, prompts me to publish the case.

CASE REPORT

On December 12, 1927, I was asked to operate upon a girl, seven years of age, for acute appendicitis. I urged immediate removal from a neighboring town where she lived, to the Lenox Hill Hospital. The child had been taken ill three days before in the evening with unexplained repeated vomiting, and accompanying constipation as the principal signs of disease, after having partaken of the usual diet. Vomiting continued on the next day, but stopped on the day following. Then fever slowly developed with the usual acceleration of pulse and general malaise, also abdominal pain and typical tenderness.

With the appearance of fever, which the attending doctor had been waiting for, the trouble was recognized to be a fully developed acute inflammation of the appendix, demanding immediate surgical relief.

When seen late in the evening the following condition was noted: Flat abdomen; no recto- or abdominal spasm; left McBurney's point tender, with rebound pain; upper abdomen sensitive; marked tenderness over appendicular region, particularly posteriorly in the lumbar area; rectal examination omitted in order to spare the child additional excitement. Flatness on percussion in right flank, considered probably due to a filled and distended cecum. Blood count: 86 polynuclear lymphocytes, 14,000 whites; pulse 144, temperature 103.2°F. Diagnosis: Acute, likely gangrenous, appendicitis; advanced general peritoneal irritation.

Immediate operation was performed using gas-ether-oxygen anesthesia. Pararectal incision. There was no fluid in abdomen. On lifting cecum appendix was seen to run posteriorly and upward; it was firmly held in this position by a dense mesoappendix and appeared of blue-black color. The finger, run up alongside the organ, found the tip tightly adherent. Surrounding intestines and wound of abdominal parietes were carefully protected by wet pads; primary ligation of base of appendix close to cecum, clamp on distal end; division and cauterization of stump; gradual ligation and division of mesoappendix; gentle, blunt mobilization of tip; complete removal, organ intact. There was purulent infiltration of retrocecal and retroperitoneal tissues;* no fluid in small pelvis. A cigarette drain was inserted alongside cecum, just dipping into small pelvis; a second tiny one to appendicular stump. Omentum pulled was down, covering region. Layer sutures of abdominal wound with drains emerging at its middle.

At completion of operation pulse was very weak; stimulation, cardiazol, morphine $\frac{1}{12}$ grain. Rectal instillation of 500 c.c. tap water with 50 c.c. glucose, 30 c.c. bicarbonate of soda and $\frac{1}{30}$ grain of strychnine, every eight hours.

On December 13, 8 A.M., temperature was 104.2°F., pulse 132; great restlessness; at 12 A.M. temperature was 105.6°F., pulse 144; hypodermocylysis (Ringer) 750 c.c. left thigh; 5 P.M. temperature 108°F., pulse 168; black vomit; involuntary urination and defecation; wild delirium. Respiration never above 24 to 28, no cyanosis at any time, lips always bright red. Conclusion: right heart strong, satisfactory oxygenation of blood.

At 8 P.M. second hypodermoclysis, 600 c.c., other thigh; cardiazol, $\frac{1}{2}$ ampule, four-hourly, alternating with caffeine; digifolin,

*A culture from a swab taken at this place showed only colon bacillus.

* From the Private Building of the Lenox Hill Hospital.

1 ampule. For fully six hours temperature hovered at or above 108°F., then, with patient quieted by means of ½ grain of codeine per hypo, it began to drop slowly, a cheering observation, bringing the first ray of hope for ultimate recovery. After this, improvement was steady and uninterrupted. A rather persistent acute infectious nephritis yielded slowly under proper régime.

CONCLUSIONS

On looking over the experience with a somewhat critical eye, one cannot help thinking that the terrible ordeal for the little patient and her family, not to speak of the attending surgeon, might have been avoided had the earlier establishment of the definite diagnosis been possible and the inflamed focus been removed in the course of the first or second day instead of at the beginning of the fourth. *Firm* pressure in the right lumbar region might have elicited tenderness, a tenderness not found at first at the typical right McBurney's point; and an increasing polynuclear blood count might then have strengthened the tentative diagnosis of an acute intra-abdominal inflammation due to a retrocecal appendix. The absence of fever seems to have been an additional stumbling block preventing the attending physician from arriving earlier at a definite conclusion. The sudden onset of unexplained continuous vomiting with constipation in the hitherto healthy girl, without a flagrant mistake in diet, appears to us to have constituted a warning signal. Absence of the typical tenderness at McBurney's point as well as of abdominal spasm was, no doubt, a confusing element.

Fortunately, the gradual evolution of the treatment of acute appendicitis within the last thirty-five years, since the inception of early operation in these cases, has taught the profession that it is a "surgical" and not a medical disease. Even in 100 cases of acute appendicitis operated upon within the first twelve to twenty four hours, 100 usually get well, not to speak of the interval operation with its well-known 100 per cent recovery. The public too has become sufficiently educated in this respect. Moreover the family physician of today no longer experiences any difficulty in promptly establishing the definite diagnosis, and he advises his patients accordingly. He knows well the sequence of important symptoms for establishing this diagnosis: That tenderness over the area where the appendix is usually located is the first and most important sign; that right rectospasm and increase in the pulse rate are the next; that a corroborating blood count, particularly the polynuclear count, should be made and that fever is the least important on the stepladder of signs. The internist of today knows that a fulminant, acute gangrene of the appendix may exist without the slightest rise of temperature.

That this clear valuation of the important symptoms in acute appendicitis has been established the world over is a great boon to suffering humanity. Millions of people now recover in less than two to three weeks, who thirty-five or more years ago either died of sepsis or faced the varied complications such as abscess formation, fecal fistula, acute intestinal obstruction, etc., that may occur if operation is delayed. The medical profession as a whole knows today that if anywhere, then in this chapter of the "acute abdomen" early diagnosis and early operation are the all-important watchwords.

Excessively high temperatures in children have been observed in various affections. However, a temperature of 108°F. lasting for six hours with all the accompanying signs of acute sepsis, followed by recovery, is, we believe, a rare occurrence which deserves to be published. Private communications with reference to this point elicited from a number of pediatrists have revealed the exceptionality of our observation. Very high temperatures have been seen, principally in acute inflammations of the entire intestinal tract, that is, in acute dysentery of babies in the hot summer, yet they have not been quite as high, nor have they been of

as long duration as in our case, extending over several hours, except when occurring as a premortal symptom.

A last word as to the type of the infection itself. We believe that in this case we had to deal with peritoneal sepsis, not with septic peritonitis. These two pathological pictures, it seems to us, should be kept well apart. Just as an acute septic focus in any other part of the human body can bring on acute general sepsis, this can of course be the case by way of an acute gangrenous appendicitis without starting the usual picture of a generalized inflammation of the peritoneal sac. In our case there never was tympanitis, nor postoperative tenderness over other parts of the abdomen. Yet the signs of acute sepsis were well established. Fortunately the patient's heart, particularly the right heart, held out and this we believe saved the little girl's life.

In reporting this case in full, it seems to us worth stating that many of the members of the child's family have been operated upon for appendicitis, acute and chronic. The girl's grandparents on the father's side both died during postoperative treatment for acute perforative appendicitis. Her father was operated upon for acute appendicitis, with recovery. Her mother had the appendix removed in the interval after a severe acute attack. A sister and brother of her father each had a diseased appendix removed after years of repeated subacute attacks. Her own case represents the third generation in the same family afflicted with this disease. Similar observations of other colleagues are on record in the medical literature.

TREATMENT OF POSTOPERATIVE INFECTION OF THE EYE*

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NEW YORK

BEFORE the present era of intravenous injections and protein therapy, we were practically powerless in fighting postoperative infection of the eye, especially the most dreaded infection after cataract operation which leads to panophthamia and total loss of sight.

In 1926 Young[1] published an article in which he referred to his treatment of 680 cases with intravenous injections of mercurochrome. In 74.4 per cent he secured very good, sometimes even amazing, results; however, 19.6 per cent were complete failures. "In meningitis," he says, "it (mercurochrome) is apparently of little or no value; I have attempted to analyze . . . and in many cases I admit a complete inability to explain why the drug, often amazingly efficient in many cases, is utterly futile in others."

It cannot be said that mercurochrome injections are dangerous to the kidneys. Young has not seen a single case in which a definite permanent injury to the kidneys has resulted from even repeated injections of mercurochrome; necropsy reports made in Dr. McCallum's pathological department of the Johns Hopkins Hospital also confirmed the harmlessness of mercurochrome. In desperate cases Young recommends a dosage of 5 mg. per kilogram; in such cases the second treatment should follow in quick time. When full dosage is used there is imperative need for care as alarming general symptoms may develop.

The first eye report on mercurochrome was published recently by J. N. Duggan[2] of Bombay, India. He injected 15 c.c. of 1 per cent solution in freshly distilled water in seven patients. Great improvement resulted in two cases out of four of early suppuration occurring within two days. Both cases were discharged completely cured. As the other two cases showed no signs of improvement, the eyes were removed. Good results were also obtained in late suppurative postoperative cases of endogenous and exogenous origin, setting in about the sixth day after operation, a check on the inflammatory process being noticed almost immediately after the first dose. It was not found necessary to give more than three doses of 15 c.c. each for complete resolution. Of the five cases treated, four were discharged completely cured with useful vision and one case was still under treatment at the time Duggan wrote his paper. The reactionary phenomena were quite severe: malaise, chill amounting to a rigor with a rise of temperature, nausea and vomiting. Diarrhea and exhaustion were conventional signs occurring in succession soon after the injections and disappearing within about forty-eight hours. The chill was noticed within about an hour after the injection and lasted from four to six hours. The temperature never rose over 104°F. Diarrhea occurred in about 75 per cent of the cases. It was interesting to note that all the four female cases treated exhibited diarrhea in a very severe form, dysenteric in character with tenesmus and restlessness. In his report Duggan says: "Symptoms in these cases were so severe that we did not venture to repeat the dose."

On the day following the injection exhaustion was seen in some cases. Mercurism in the form of mild stomatitis and gingivitis occurred in 20 per cent of the cases. The permeation (diffusion) of mer-

[1] YOUNG, H. H. Sterilization of local and general infections. *J. A. M. A.*, 87: 1366, 1926.

[2] DUGGAN, J. N. *Am. J. Opbtb.*, January, 1928, p. 39.

* From the Ophthalmological Service of the Lenox Hill Hospital.

curochrome through the system was evidenced by the appearance of chrome color in the vomit, urine and stools. The maximum period noticed for complete elimination was seventy-two hours and so subsequent injections could be given quite safely after this period.

Duggan states that while mercurochrome did good service in all cases of late infection, no definite opinion could be formed of very early infections.

Discussing Young's paper, Hinman remarked that he found there were two distinct types of patients, one type who will tolerate very well the intravenous use of mercurochrome, and the other type who is intolerant; apparently those who were intolerant were never benefited. R. J. Stroud stated that the mercurochrome on entering the blood makes perhaps a protein absorption of some kind and gives the protein shock of non-specific protein which it parallels in action and results. The results obtained by him would show that mercurochrome is not a sterilization.

It is most probable that Hinman's and Stroud's remarks hit the mark. While we have not experimented with mercurochrome, we have worked with intravenous injections of urotropin which, since 1926, we have used in two cases of infection after cataract operation. Fortunately, postoperative infections are not everyday occurrences. We take the liberty therefore of publishing our few experiences with urotropin, hoping to benefit others and to advance and enlarge our own knowledge of fighting a most dangerous eye condition.

For many years urotropin has been recognized as a most efficient disinfectant of the urinary tract. Its usefulness lies in the formation of formaldehyde which takes place in acid solution, although to less extent in neutral fluid and, according to laboratory experiments does not take place in fluids with an alkaline reaction. As the tissue fluids are mostly of an alkaline reaction one could expect very little from urotropin in organs other than genitourinary where the urinary secretion is acid. Any benefit derived from the use of urotropin in alkaline fluid is presumably due to local acidosis brought about by inflammatory products. In diseases of the gall bladder clinical experience records very favorable action from urotropin, and neurologists have long ago reported a like favorable action in mild infections of the meninges.

In 1923 Tackert collected reports on the action of urotropin in various diseases and came to the conclusions that urotropin acts as a bactericide through the local acidosis which takes place in the infected tissues thereby releasing formaldehyde, and that ammonia and the undecomposed urotropin reduce the growth of bacteria by impairment of the soil on which they flourish. As a hypertonic solution, urotropin favors the osmosis of water, salt and colloids between the blood and the tissue fluids, increases absorption and stimulates the secretion of urine. It is doubtful whether a strongly alkaline solution would be influenced by a general acidosis. Clinically, the drug has been successfully used before operations on the meninges, gall-ducts and urinary tract.

In 1925 Lutz reported in von Graefe's Archives his experiences with urotropin in diseases of the eye. He treated a series of eye diseases, some not suppurative, with urotropin injections and had very favorable results. As a rule he gave one injection a day for the first eight days, sometimes, when necessary, two a day. In one case of corneal ulcer he gave six injections within a period of three days. His observations are highly interesting especially where he found an iridectomy necessary after a course of fruitless urotropin injections in a case of glaucoma. The water of the anterior chamber was no longer fluid but coagulated, showing how powerful an action urotropin can exert in the interior of the eye without any deleterious after effects. As to the dosage contents, a 31 grain ampule is employed for one injection.

In 1915 Remele published his experi-

ments on animals as to the penetration of urotropin into the anterior chamber of the eye and its splitting up into formaldehyde. Similar experiments made by Batschwarowa on animals as to the penetration of iodide of potassium into the anterior chamber, have shown that a larger amount of iodide was found in the anterior chamber when a preliminary paracentesis had been made. It seems logical, therefore, in cases of postoperative infection to let the water of the anterior chamber escape by opening it with a spatula each time immediately before giving an intravenous injection. Urotropin, while not strictly a disinfectant, exercises without doubt a powerful influence in helping nature fight infection.

In combination with intravenous injections of urotropin we used foreign protein injections as an adjunct. We admit that horse serum (3 c.c. given intramuscularly) is the most effective of the foreign protein; we did not use it, however, in our two cases but used milk instead (10 c.c. intramuscularly) as we were afraid of too powerful an action in our two elderly female patients. Locally subconjunctival injections of bichloride of mercury, 1:3000, near the section of the wound were given.

Both cases presented the typical picture of pneumococcus infection twenty-four hours after operation; in both cases we succeeded, in what seemed to us well-nigh a miracle, in arresting this dangerous condition and in preventing the spreading of the infection from the corneal wound by way of the anterior chamber into the vitreous. Although the eyes remained irritated for months they eventually quieted down. The first case was operated on June 17, 1926, when infection occurred; then when operated again on October 19, 1926, iridectomy down and in was performed. The final discission which gave the patient nearly normal sight was done January 20, 1927. The second case, operated on October 13, 1927, is just getting ready for an iridectomy down and in, the pupillary area being occupied by an organized exudate, with a subsequent discission to give useful vision.

In cases of cataracts when an eye appears to become infected after operation we administer the urotropin intravenously while the patient is on the operating table or immediately on his return to bed.

As regards the great future of intravenous therapy, Ehrlich's prophecy made before the 1913 Congress of Medicine seems to have come true.

ACUTE APPENDICITIS*

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MY reason for presenting this report is to call attention to the rather high mortality of acute appendicitis and to the difference in cases diagnosed and operated on early and those operated on after perforation has taken place. Because of the frequency of acute appendicitis it is one of the most important surgical conditions with which we have to deal, and it behooves every doctor constantly to bear this in mind when called to see a patient with acute abdominal symptoms.

There is a general impression that we know all about acute appendicitis and that nothing more is to be learned. This has resulted in a self-satisfied attitude towards it. A closer study, however, teaches us that many patients are not admitted to the hospital until after perforation has taken place and that it is particularly this group which furnishes the mortality. This is true even in New York City where doctors are readily available and where hospitals are easily accessible. Most of the patients afflicted are children with a promise for the future, or adults in the prime of life who are useful members of society and of inestimable value to their families. It becomes doubly important therefore to operate early, not only to save the life of the patient, but to avoid a long convalescence. In order to understand the problem at hand and to approach it intelligently it is necessary to know the reasons for failure to bring patients to early operation and there are several. Some are the fault of the patient and others the fault of the family physician. Many patients are unwilling to call a doctor for what they consider ordinary intestinal cramps. The result is delay and usually the administration of a laxative which increases peristalsis, thereby probably delaying the walling off of an inflamed appendix, and no doubt frequently favoring perforation.

FAILURE TO DIAGNOSE

In spite of the widespread information on appendicitis among the general public, it is surprising how often they fail to recognize their symptoms. The symptoms of pain and vomiting, especially if the right side is affected, would immediately make them think of appendicitis in some other person, but when applied to themselves they do not recognize the condition. This is true of very intelligent people as well as of the less educated. They blame it on something they have eaten, or on a cold, or constipation. If the diagnosis is suggested to them, or even positively made, many patients fail to see the importance of close observation and examination and do not favor operative interference. Their attitude is that the attack may pass over; they know of some one who has had appendicitis "frozen out" and they wish to follow a similar conservative course. Family and business considerations may influence a patient to make light of the symptoms and signs and he may even deliberately attempt to mislead his doctor.

The failure of a physician to make an early diagnosis is explained by several factors. The majority of cases he sees with pain and vomiting are ordinary gastrointestinal upsets. The patient does not look sick in the beginning; there is often no temperature and the pulse is hardly raised. The local signs may be absent or misleading, especially if the appendix is situated behind the cecum or

* From the Surgical Service of the Lenox Hill Hospital.

colon or if it hangs into the pelvis. Then too, the patient may have such a plausible explanation for the symptoms that the doctor may be misled. He may not reexamine for a few hours because of the patient's desire for economy and similar reasons, and thus the acute inflammatory process continues. When one considers how much depends on early diagnosis and early operation it must be emphasized again and again to examine all patients with abdominal pain and vomiting carefully and if there is doubt, repeatedly. The difference between a case admitted and operated on before perforation has taken place when, after removal of the appendix, the abdomen can be closed without drainage and with a convalescent period of only ten to fourteen days, and a case with perforation and local peritonitis, in which drainage has to be instituted with the added risk of complications and a convalescent period of from two to eight weeks or more, is so striking that every one who has seen it must be impressed. A physician cannot be blamed for failure to make an early diagnosis in a patient in whom the symptoms are masked, but he can be held responsible for failure to reexamine such a patient after several hours. Physical signs may then be fully manifest. It is surprising how rapidly they sometimes develop.

SYMPTOMS

The symptoms of acute appendicitis usually appear in the following order: Abdominal pain, vomiting, fever. The pain is cramplike in character, is situated in the epigastrium or around the umbilicus and after some hours shifts to the right lower abdomen where it remains localized as a soreness. It may be severe or slight, but is usually the one outstanding complaint of the patient, and it is its persistence which should call attention to inflammation rather than to ordinary cramps. At times it radiates to the lumbar region or to the bladder and it is necessary to rule out kidney, bladder or pelvic conditions. Vomiting may be severe, or may occur only once, or be entirely absent. Its presence certainly is important and should weigh in favor of the diagnosis of appendicitis.

Fever may be absent early in the disease but invariably develops as the inflammatory process progresses. Much depends, therefore, on the time the patient comes under observation. In those seen on the first or second day it ranges from a slight rise to 101°F. or 102°F., and may never go higher. On the other hand in patients with a perforation and spreading peritonitis it may go much higher. Very high temperature may indicate complications, such as peritonitis, or abscess formation or thrombophlebitis of the ileocecal vessels. Fever is one of the symptoms on which too much weight should not be placed early in an attack, for even in a completely gangrenous appendix there may be no temperature for hours after the onset. It is particularly these patients who should be reexamined after a few hours and if other symptoms and physical signs point to the suspicion of appendicitis, a slight rise may then be found which would be in favor of the diagnosis.

In a typical case the physical signs are definite and easily elicited. There is rigidity over the right lower quadrant associated with tenderness. Palpating very lightly has advantages over deep pressure as it makes it possible to determine the slight degree of rigidity found in the early cases. Rebound tenderness is of value. Associated tenderness over the left lower abdomen indicates peritoneal irritation due to the presence of inflammatory exudate but does not necessarily mean peritonitis. These physical signs, tenderness and rigidity, however slight, are the most important points in reaching a diagnosis. If all symptoms except an acute onset of pain are absent, and one finds slight tenderness and rigidity over the appendix, the presence of acute appendicitis has to be strongly suspected. Additional information one may utilize in reaching a definite diagnosis are the pulse

rate and blood count. The former is nearly always elevated to 80, 90 or 100 per minute, and is often found to be of more value than the temperature. A blood count will nearly always show leucocytosis with a proportionate increase in polymorphonuclear neutrophiles. The count may vary from slightly over 10,000 to 20,000 or 30,000, and the leucocytes from 80 to 90 per cent or more. Attempts have been made to judge the severity of the pathological condition of the appendix and peritoneum by the degree of leucocytosis, but this has been found to be misleading. In a doubtful case the simple determination of leucocytosis with a high polymorphonuclear count is sufficient aid. If, after all these examinations, one is still in doubt, it is advisable to wait a few hours before repeating the examinations. Usually a diagnosis can then be made. It is in those patients in whom the appendix is situated in a position farther away from the anterior abdominal wall, that an error in diagnosis is more easily made. It may be situated behind the cecum or colon, or to the inner side of the colon reaching almost to the liver, or it may hang over the brim of the pelvis. These possibilities must be borne in mind and careful palpation, including a rectal examination, will usually clear up the case.

OPERATIVE PROCEDURE

The choice of the operative procedure may have some bearing on the mortality or morbidity. It has been our aim to have the incision so placed as to reach the appendix most directly. The physical signs are a guide in this, for the point of greatest tenderness and rigidity should be chosen. If these indicate a high appendix, the incision should be made high. If the signs over the usual appendix site are almost absent, and there is much tenderness on rectal examination, the incision should be made correspondingly low. Adequate exposure is essential for careful operating. In the typical case we use the Kammerer incision as a routine. In case we feel that the appendix is situated in the iliac fossa and are reasonably certain that it has not perforated, a McBurney incision may be employed. The technique used in a simple nonperforated case is too well known to require description. However if after opening the peritoneum free exudate is found, whether odorous or not, it is removed with the aid of gauze sponges. Gauze tampons moistened in saline are then carefully packed around the affected area to protect the free peritoneum. No manipulation of the appendix region is attempted until these tampons have been inserted. The appendix is then isolated and extirpated, and any pus surrounding it is removed by mopping. A cigarette drain is then inserted to the appendix bed and the abdomen closed. In case there is profuse exudate, extending along the lumbar gutter or into the pelvis, it is removed with the aid of sponges or a suction apparatus as conditions may demand. Additional cigarette drains or soft rubber tubes may then have to be inserted. Occasionally we use a Mikulicz tampon, but very rarely resort to the use of gauze packing and never to rigid drainage material. We never pour fluid into the wound for the purpose of washing it, as the pressure exerted by it has the tendency to spread infection into the uninvolved portions of the peritoneum.

STUDY OF 250 CASES

I have selected 250 consecutive, personally observed cases for this study. All were treated at the Lenox Hill Hospital and were operated on either by one of my associates or myself. They include all types and degrees of acute suppurative inflammation and gangrene, from simple uncomplicated cases to those with abscess formation or peritonitis. Subacute cases and acute catarrhal inflammations are not included. Bearing in mind that the chief purpose of this article is to call attention to the importance of early diagnosis and treatment, the relation between time of onset and operation is given special con-

sideration, and attention is called to the diagnostic aids. All patients had either one or several of the cardinal symptoms and the physical signs of tenderness and rigidity of varying degrees were present, though in some cases they were difficult to elicit. Fever of some degree was present in all cases.

Table I

Cases	Temperature	No. of Perforations	Per Cent
61	Under 100°F.	14	23
105	Up to 101°F.	42	40
49	Up to 102°F.	24	49
35	Over 102°F.	32	94

Table I shows in a very clear way that a low temperature is not a definite indication for the assumption of a mild attack, but on the other hand it does show that the higher degrees of temperature are more likely to be present in patients with perforation.

The pulse rate gave somewhat more striking information regarding the severity of an attack, as Table II will show.

Table II

Cases	Pulse	No. of Perforations	Per Cent
140	Under 100	49	35
81	Up to 120	40	49
29	Over 120	23	80

A blood count was not done in all cases for various reasons. When the diagnosis was very definite the operation was decided on without its aid. It was chiefly resorted to as corroborative evidence in the somewhat doubtful cases, or for purposes of record. Table III shows findings obtained in the 166 cases examined.

Table III

Cases	Leucocytes	No. of Perforations	Per Cent
15	Under 10,000	7	46
55	Under 15,000	24	44
96	Over 15,000	44	46

The conclusion is very evident that the degree of leucocytosis is not an indication of the severity or extent of an attack. With a very careful technique in the hands of one man, it may at times be possible to draw more definite conclusions but in a regular hospital service that is not the case. The simple establishment of a leucocytosis is sufficient corroborative evidence to make the diagnosis. The same is true of the differential count. To try to draw distinctions between a gangrenous or an acutely inflamed, a perforated or a non-perforated appendix on the basis of a blood count is very misleading.

The most important aids in diagnosis are tenderness and rigidity over the right lower quadrant, and they are best elicited by careful and gentle abdominal palpation.

Of the total number of 250 cases, 112 were found to have perforated at the time of operation, while 138 had not perforated. Table IV shows that some of the perforations occurred on the first day but that they were very much higher on the second and subsequent days. I may here add that it is the practice on our service to operate on all cases of acute appendicitis as soon as practicable after the diagnosis has been made. This is usually within a few hours after admission, though at times there is an unavoidable delay.

Table IV

Cases	Days of Illness Prior to Operation	No. of Perforations	Per Cent
102	1	20	19
59	2	35	60
39	3	20	51
15	4	11	70
12	5	8	66
4	6	2	50
4	7	3	75
1	8	1	100
5	9	4	80
9	10	8	88

Table IV demonstrates conclusively the importance of operating during the first day, for the majority of patients do not

perforate until after that time and the abdomen can usually be closed without drainage. In nearly all cases where an exudate was present cultures were made resulting in a positive report in 98, the majority of which were due to colon bacilli, with Staphylococci and Streptococci next in frequency.

Although perforation was found to be present in only 112 cases, drainage was instituted in 148. These additional drainage cases were those in whom the field looked soiled after removal of a gangrenous appendix and the drainage was put in as a safety valve. A culture was made of such a field and if it was reported negative the drain was removed in forty-eight to seventy-two hours and usually did not result in prolonging convalescence.

COMPLICATIONS

The complications were numerous. We have divided them into general and local, the former being those not directly connected with the intra-abdominal lesion as such, the latter those which bore some relation to the appendix inflammation.

In the general group there are 12 cases: pneumonia 6; bronchitis 2; pleurisy 2; phlebitis 1; pyelitis 1.

Under local complications there have to be counted all those lesions which are in direct relation to the appendix. There is naturally some peritonitis around every inflamed appendix, whether perforated or not. These milder forms, even if perforation had taken place but was apparently early and had not spread, have not been classed as a complication, for many of them heal very promptly after a few days of drainage and prolong the convalescence but slightly. We have classed as peritonitis only those cases which had an extensive exudate, either a so-called spreading peritonitis or general peritonitis.

There were 60 such local complications, divided as follows: peritonitis 23; abscesses 24; infection of abdominal wall 5; fecal fistula 4; sepsis 2; acute ileus; 2.

Under abscesses we have classed primary appendiceal abscesses which we see infrequently, as well as abscesses developed secondarily at some distant portion of the abdomen. They include pelvic, abdominal, subhepatic, subphrenic and liver abscesses resulting from a septic thrombophlebitis.

Practically all of these complications developed in the more advanced cases and are the chief argument in favor of early operation. It is this group of cases which often has a prolonged convalescence, from several weeks to occasionally two to three months, due to long drainage and fistula formation. At times one complication after another develops resulting in an eventual cure, or leaving the patient more or less disabled with a weak abdominal wall. It is this same group which furnishes the mortality and every effort should therefore be made to bring the patients to early operation before perforation has taken place, or at least before the exudate has a chance to spread into distant portions of the abdomen.

The length of stay in the hospital was on the average ten to fourteen days for the nonperforated cases and twenty-one to twenty-eight days for the simple perforated cases. For those with complications or a fistula no average can be given, for it varied from a month to two or three months and occasionally longer.

The mortality in this group of 250 cases was 9, or 3.6 per cent. Death was due to peritonitis in 7 cases and in the other 2 to septic thrombophlebitis with multiple liver abscesses.

CERVICAL STUMP CARCINOMA*

FOLLOWING SUPRAVAGINAL HYSTERECTOMY
REPORT OF TWO CASES WITH A DISCUSSION OF THE ADVISABILITY OF SUBTOTAL HYSTERECTOMY

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THERE has long been a difference of opinion among gynecologists whether, in conditions requiring removal of the uterus, the entire organ should be excised or a vaginal stump allowed to remain. In addition to causing increased operative shock, total hysterectomy has obvious disadvantages as compared with the supravaginal procedure, since the retained cervical stump gives support to the pelvic floor.

The strongest objection to subtotal hysterectomy, on the other hand, is the fact that malignant disease may later develop in the cervical stump. Careful judgment therefore, is required to determine whether the mechanical advantages of supravaginal hysterectomy are outweighed by the hazard of subsequent cancer, or vice versa. To help us in this decision we must form some estimate of the frequency with which cancer develops in the cervical stump after supravaginal hysterectomy.

Fleischmann[1] reported 4 cases of cancer in the stump developing after supravaginal hysterectomy and stated that over 50 cases have now been recorded. He believes that when supravaginal hysterectomy is performed for uterine fibromyomas the amputation surface of the cervix should be examined carefully for suspicious spots. If the cervix should show pathological changes such as hypertrophy, lacerations, ulcerations or long-standing catarrh, he believes that complete hysterectomy should be given the preference. Furthermore, all women who have been subjected to supravaginal amputation should remain under observation for a number of years.

Isbruch[2] collected from the literature 65 cases of cancer of the stump after supravaginal amputation and described 2 cases under his own observation. He believes that the cervix should be examined microscopically for the presence of malignant disease before or during every supravaginal hysterectomy and that, if this caution is obeyed, the advantages of the partial operation need not be given up. Isbruch advocates a short cervical stump and believes that such patients should be examined periodically for years after operation, in order that any developing malignant disease may be detected in its incipiency.

Hochman[3] reviewed the records of 1114 cases in which supravaginal hysterectomy had been performed between 1918 and 1922 and found only 3 cases in which malignancy of the cervical stump had developed up to 1926, representing an incidence of only 0.27 per cent.

At the Lenox Hill Hospital the writer collected a series of 175 cases in which supravaginal hysterectomy was performed between January 1, 1920 and January 1, 1926. As careful follow-up study is employed wherever possible at this institution, the majority of these patients have been examined from time to time subsequent to their operation. As yet carcinoma of the cervical stump has not been observed in any of these cases, but of course it is too early to predict what percentage of them may ultimately develop malignancy. The 2 cases I am reporting did not belong to this group. One of them was a private case; the other had supravaginal hysterectomy in 1902.

* From the Gynecological Service of the Lenox Hill Hospital.

According to Sharples,[4] carcinoma of the cervical stump occurs in 2 per cent of cases following supravaginal hysterectomy. He cites 3 of his own cases, in which malignancy developed after supravaginal hysterectomy performed for the treatment of benign tumors.

Shaw[5] reported that he had seen 3 cases of cancer of the cervical stump following supravaginal hysterectomy but nevertheless favored the use of this operation in suitable cases. He recommends subtotal rather than complete hysterectomy in the case of the nulliparous uterus or the multiparous uterus in which there is no damage to the cervix. When the cervix is torn or is the seat of chronic inflammation, he prefers to do total hysterectomy.

Numerous other writers have reported the incidence of malignant disease in the remaining cervical stump, but only a few of these reports will be cited as typical of the entire group. Frank[6] reported a case in which a beginning carcinoma of the cervix had been overlooked one year previously when supravaginal hysterectomy was performed for uterine fibromyomas. An unusual feature of this case was metastasis to the vermiform appendix.

Reporting 2 cases in which carcinoma developed in the retained stump after amputation of the uterus above the cervix, Polak[7] urged that this operation should be employed only when the cervix is free from injury or disease in nulliparous women. He quoted the combined statistics of Schottleander, Herbert Spencer and Noble, comprising 900 cases in all, in which the cervix was examined pathologically after total hysterectomy and in which malignancy, unrecognized clinically, was found in 2 per cent of the cases. These growths would have been left behind and allowed to develop had supravaginal hysterectomy been performed instead of the total operation.

Polak,[7] originally a strong advocate of total hysterectomy, has somewhat modified his views of recent years. He states that when total hysterectomy is too difficult we can protect the woman from subsequent cancer by destruction of the entire gland-bearing area with the actual cautery or by the introduction of radium. Therefore, he is now doing fewer total hysterectomies than formerly.

Masson[8] states that during the last five years 29 cases of carcinoma of the cervical stump were observed in the Mayo Clinic. Of these, 21 (72 per cent) occurred one year or more after supravaginal hysterectomy; 55 per cent at least three years afterward and in 1 case there was an interval of fifteen years. Masson believes that many of the difficulties of complete hysterectomy, such as shortening of the vagina, loss of support for the vault of the vagina and the added risk of peritonitis or infection and injury to the ureters, bladder and sigmoid, can be overcome by careful technique.

Corscaden[9] urges that carcinoma of the cervical stump following supravaginal hysterectomy is sufficiently frequent to demand attention. He states that the possibility of the subsequent development of malignant disease must be balanced against simpler technical performance and lower operative mortality, when weighing the value of this operation against total hysterectomy. Corscaden takes the stand, and I agree with him, that prophylactic excision of the cervix in connection with hysterectomy should be performed for cause and not routinely. If the cervix is diseased, it should be removed, but if it is not it should be treated with the respect due to all normal tissue.

The earliest symptom of cancer of the cervical stump is a variable amount of hemorrhage, which is obviously of grave significance, since the uterus has been removed. The danger of the development of malignancy in the cervical stump can probably be obviated to some extent by cauterization or irradiation of the cervix after every supravaginal hysterectomy.

CASE REPORTS

Case I. L. K., widow, aged sixty-four, was referred to me by Hermann Graeser of this city, on September 26, 1927, with the following history: Supravaginal hysterectomy had been performed six years previously for multiple uterine fibromyomas, at which time the uterine growths were examined microscopically and showed no evidence of malignancy. The menopause had taken place nineteen years previously, but in December, 1926, the patient noticed vaginal bleeding, which condition was not helped by treatment.

Vaginal examination showed a normal senile vulva. The vagina was wide, readily admitting two fingers. The cervical stump was much longer than normal and its circumference was definitely increased. It was hard but movable. There were no abnormal conditions at the external os, and outwardly the cervix appeared normal except for its increased size.

Following the introduction of a uterine sound there was considerable bleeding from the cervical canal. A quantity of mushy material, very plainly suggesting malignancy, was expelled. When the curette was introduced, a considerable amount of this débris was removed.

The pathological report of the scrapings by George L. Rohdenburg, Director of the laboratory, was as follows: "Microscopical examination shows a uterine endometrium in which the stroma is scanty and very delicate. The glandular elements present a varying picture in separate areas. In some portions they are closely packed together but regular in size and outline without excessive numbers of mitotic figures. In other areas the glands are irregular in size and form, with numerous mitotic figures present and a considerable degree of change in staining reaction, the cells becoming more acidophilic. In still other areas there is a frank carcinomatous change with a new growth composed of large columnar cells arranged in papillary formation. These cells are markedly hyperchromatic, and the centrally placed nuclei show numerous mitotic figures. The character of the cells bespeaks a fundus origin. Diagnosis: Adenocarcinoma."

On the basis of the pathologist's report and the clinical findings, it was decided to extirpate the cervical stump without delay. On September 30, 1927, the operation was performed by the vaginal route under nitrous oxide anesthesia. The stump was loosened from the surrounding tissue by means of a circular incision and blunt dissection, the arteries being clamped off and ligated. It was then easy to enucleate the whole stump, since the carcinoma had apparently not yet invaded the paracervical tissue or parametrium. The peritoneal covering of the stump was found to be free, and the stump itself was easily movable. The connective tissue was reunited with four buried chromic catgut sutures and the vaginal mucosa sewed up with four interrupted chromic catgut sutures.

The patient made an uneventful recovery from the operation and is now receiving postoperative prophylactic high-voltage roentgen-ray treatments. It is of course much too early to predict what the outcome will be.

Microscopical examination of sections through the cervical stump showed adenocarcinoma diffusely infiltrating the wall and in one area extending into the parametrium. The neoplasm showed considerable mucoid degeneration.

Case II. A. N., widow, aged fifty-five, was admitted to the Lenox Hill Hospital on June 13, 1925, complaining of uterine bleeding of one week's duration. She had been married and widowed twice and had had two children and one abortion. Twenty-three years previously supravaginal hysterectomy had been performed, at which time both ovaries and one Fallopian tube had been removed. The present illness began one week prior to admission with a sudden profuse hemorrhage from the vagina. For two months, however, she had noticed a brownish discharge.

On vaginal examination a bloody discharge was found and the cervix was very thick and irregular. It was eroded and bled easily when examined. The mass was located in the anterior lip of the cervix, which had the appearance of being much hypertrophied. Within the canal and on the anterior lip there was an area of ulceration and necrosis about the size of a dime.

A small wedge-shaped area of tissue was excised from the anterior lip of the cervix for microscopical examination. The pathologist's report was as follows: "Section of the cervical fragment shows the normal cervical tissue to be replaced by a malignant growth composed of branching and anastamosing strands and columns of cells and irregular cell masses. The

tumor cells are small with scanty, poorly defined cytoplasm and relatively large, round or oval nuclei, which take a deep basic stain. Among these structures are a few gland-like spaces lined with similar cells. The stroma is abundant and consists of a fibrillar basophilic matrix and many cells. The latter are for the most part spindle or oval in shape and show no definite arrangement. Some of the stroma cells show mitotic figures and division figures are also observed in the tumor cells."

The patient was treated with radium needles and referred to the Cancer Institute.

COMMENT

The question naturally arises: Should we continue to perform supravaginal hysterectomies for uterine fibromyomas and risk the subsequent development of cancer in the cervical stump or would it be more advisable to remove the cervix as well as the body of the uterus at the time of the operation? The answer to this question can be given only after carefully weighing the advantages and disadvantages of the two procedures.

If the performance of a subtotal hysterectomy increased the possibility of the later development of cancer in the stump, the total operation would seem more logical, but, as a matter of fact, available statistics indicate that the cervical stump is no more subject to malignant disease than the normal cervix. If we are to apply the principle of prophylactic removal, why do we not remove the normal cervix as well?

Besides the increased difficulties of operation and the greater degree of shock, total hysterectomy has definite disadvantages as compared with the supravaginal procedure. The remaining cervical stump serves as a foundation for the pelvic floor, prevents shortening of the vagina, and is of considerable importance to the woman who continues her marital relations.

On the other hand, I believe that there are conditions in which the cervix as well as the body of the uterus should be removed. When there are severe scars or the cervix is the seat of chronic inflammation, it is illogical to preserve such a likely source of future trouble. The decision as to preserving or removing the cervix with the body of the uterus should rest on the condition of the cervix at the time of the operation.

An interesting feature in the first case was the type of lesion that developed in the cervical stump, namely, adenocarcinoma. Ewing[10] states that adenocarcinoma reproducing the alveoli of the cervical glands occurs in a small proportion of cervical malignancies. The growth appears first as a submucous nodule in the cervix or portio, but in its later stages it reaches the cervix as a papillary, cauliflower or ulcerating growth.

The usual type of malignancy in the cervix is a squamous or flat-cell carcinoma, whereas adenocarcinoma generally arises from the body of the uterus. The probable explanation is that when the supravaginal hysterectomy was performed the amputation of the uterus was made at a somewhat higher level than is customary, with the result that some of the typical endometrium of the fundus was left behind with the stump. It is probable that the adenocarcinoma originated from this remnant of endometrial tissue. Since adenocarcinomas are admittedly not so malignant as the squamous-cell varieties usually found in the cervix, we can understand why the adjacent tissues were not invaded.

SUMMARY

This is a report of two cases of carcinoma of the cervical stump developing after supravaginal hysterectomy. The first was a case of adenocarcinoma, occurring six years after operation for uterine fibromyomas. The patient was a widow, aged sixty-four, whose menopause had taken place nineteen years previously. She observed intractable vaginal bleeding. The appearance of the cervix strongly suggested malignancy, and the diagnosis of adenocarcinoma was established by examination of the scrapings. The growth was not extensive and the stump was easily enucleated.

The second case was one of carcinoma of the anterior lip of the cervix, occurring in a woman of fifty-five, twenty-three years after subtotal hysterectomy. The first symptom was sudden profuse bleeding from the vagina. When vaginal examination revealed an area of induration, ulceration and necrosis in the cervix, which bled on slight manipulation, the diagnosis of malignancy was made. It was confirmed by biopsy.

Carcinoma of the retained cervical stump occurs in a definite percentage of cases after subtotal hysterectomy but apparently not more frequently than in women who have not been subjected to operations. I believe that in the average case this hazard is outweighed by the advantages of the supravaginal procedure, namely, the support offered to the pelvic floor by the stump, the preservation of the length of the vagina and the lesser degree of surgical shock. The decision as to whether or not the cervix should be removed along with the uterus should be based on the condition of the cervix itself. If it is diseased or is the seat of lacerations or erosions, total hysterectomy is preferable, but if the cervix is normal it should be treated with the respect due to all healthy tissue.

SUPPLEMENTARY NOTE

Since this article was written another communication has appeared on the subject. Ott[11] states that his clinical experience has demonstrated that in cases of myomatous uterus the best treatment is radical removal of the uterus, including the cervix. Ott's views, however, are not shared by the writer, as shown in the foregoing paragraphs.

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WELCH BACILLUS INFECTION

COMPLICATING COMPOUND FRACTURE*

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THE gas producing organisms are not commonly encountered in the practice of civil surgery excepting in the larger municipal hospitals that carry on an active emergency service. In such institutions, of course, conditions comparable to those of war surgery are frequently met. Gunshot wounds and compound fractures offer fertile fields for the development of the spore bearing, anaerobic bacteria or Clostridia.

Certain tissues are only slightly, if at all, susceptible to this infection. In fact the skin and connective tissue seem to act as barriers to its progress. Gas gangrene or malignant edema is peculiarly a disease of muscle. Damaged muscle is the perfect medium for its beginning. When once started, it spreads with rapidity through the muscle or muscle group, in the direction of the fibers. The sinister significance of the disease lies in this almost unbelievable swiftness of its advance and in the devastation that remains in its path. When the presence of this organism is detected in a wound of an extremity, there is an overwhelming impulse to amputate, to block its progress at any cost.

CASE REPORT

A girl, aged six, came into the hospital on the night of October 31. She had a compound fracture of the lower end of the left humerus, due to a fall in the street. The lower fragment was displaced backward and outward and there was slight bleeding from the small puncture wound on the anterior surface of the arm. No bone protruded. An antiseptic dressing was applied, the extremity placed comfortably in a right-angle splint, and 1500 units of tetanus antitoxin administered.

On the following morning, in the operating room, the fracture was reduced with anesthesia. Because the edema made acute flexion a danger to the blood supply, retention could be only imperfectly maintained. No further effort was contemplated until after subsidence of the swelling. The temperature and pulse were not elevated at this time.

The next afternoon the temperature reached 101°F., the pulse-rate increased and there was more pain in the region of the fracture. There was no increase in the swelling no discharge from the wound or other external evidence of a severe infection. During the night the temperature rose and when the patient was seen the following morning it had reached 104°F. The whole aspect had changed: The patient was alert and complaining of pain; the entire extremity had become swollen and discolored; the forearm and hand were cyanotic. From the level of the elbow, extending up the arm and across the chest to the midsternal line was a distinct bronze discoloration. The margins of this area were sharply outlined and map-like, but not elevated. There were no blebs. Over the anterior and medial aspects of the arm, and in the subclavicular region, a crackling sensation could be elicited. The necessity for immediate interference was altogether evident.

One incision was made from the antecubital area up the anterior surface of the arm to the shoulder and a second from the shoulder to the left margin of the sternum, just below the clavicle. Both incisions were carried through the fascia, which had a mottled yellow-green appearance. The underlying muscles were of a dark blue, cadaveric hue. On splitting them in the direction of their fibers, a chocolate-like exudate welled up, bubbling with gas. There was a sickening sweet odor. To relieve tension further the first incision was extended down the forearm and incisions were made also on the posterior aspect of the arm and forearm. In these locations there was no evidence of infection.

The wound, with its edges widely retracted, was freely lavaged with hydrogen dioxide. Six

* From the Surgical Service of the Lenox Hill Hospital.

Carrel tubes were inserted into the recesses of the wound, a light dressing was applied and the patient was returned to bed, the forearm being suspended at the wrist. Through the Carrel tubes the wounds were immediately irrigated with potassium permanganate solution in a strength of 1 to 500, large enough quantities being used thoroughly to saturate the dressings. This was repeated every hour for forty-eight hours. After that the strength of the solution was reduced to 1 to 1000 and so continued for another two days.

Fig. 1.

Fig. 2.

Fig. 1. November 1, before any attempt at reduction had been made.
Fig. 2. November 12, no attempt as yet made to improve the position of the fragments because of the occurrence of infection.

On the day of operation 100 c.c. of anaerobic antitoxic serum were administered intravenously. Another 60 c.c. were given the following morning.

From the time of operation the infection showed no tendency to spread. The wounds steadily improved in appearance so that by the fourth day they had assumed a healthy deep red color, excepting the immediate area of fracture where a necrotic patch remained. Here a Carrel tube was left in place and the use of Dakin's solution substituted for that of potassium permanganate. All other tubes were removed.

The temperature and pulse declined gradually to normal during the course of eight days and the general condition became rapidly better.

By the seventeenth day the wound had become sufficiently clean to invite an attempt to improve the position of the fragments which could be plainly seen lying in its depths. A fair amount of callus had developed.

The lower fragment was easily liberated but was so small and of such a shape that it could not be retained in position. Therefore the extremity was again suspended at the wrist with the elbow in a right-angle position. To bring the fragments into position light traction was necessary by means of weight and pulleys, one in the direction of the upper fragment and the other downward on the lower end of the upper fragment. The use of adhesive plaster for traction bands was not possible so that it was

necessary to rely on broad flannel bands placed around the outside of the dressing. These were somewhat unsatisfactory because traction could not be properly maintained during dressings. After ten days of this treatment the traction was removed. The weight was applied in the direction of the forearm on alternate days so that the elbow was flexed for twenty-four hours and then extended for the same period. In this way about 30° of passive motion were maintained while the patient remained in the hospital.

Fig. 3. November 18. Following liberation of the callus and lower fragment which could not be retained in position. Suspension and traction were then begun.

Successive roentgenograms showed the lower end of the upper fragment projecting toward the coronoid process of the ulna and so limiting flexion beyond a right angle. At the same time the development of a new shaft could be traced in the line of the periosteum that had been elevated from the posterior surface of the bone.

The patient left the hospital on January 25, almost three months after admission, in good general condition with all wounds healed, the arm being in a good working position but with a bare 20° of motion in the joint. The hope that, with an effort on the part of the parents to encourage active use of the extremity and with the aid of regular physiotherapeutic treatment, the range of motion might be maintained or even increased, did not materialize. When last seen, at the return clinic of June 10, motion in the joint was barely perceptible. A late roentgenogram shows very little recession of the old shaft and an excessive callus development.

Fig. 4. Just before leaving the hospital, after three months, showing the new shaft, developed in the line of the periosteum, the lower end of the old shaft interfering with flexion and showing little tendency to recede.

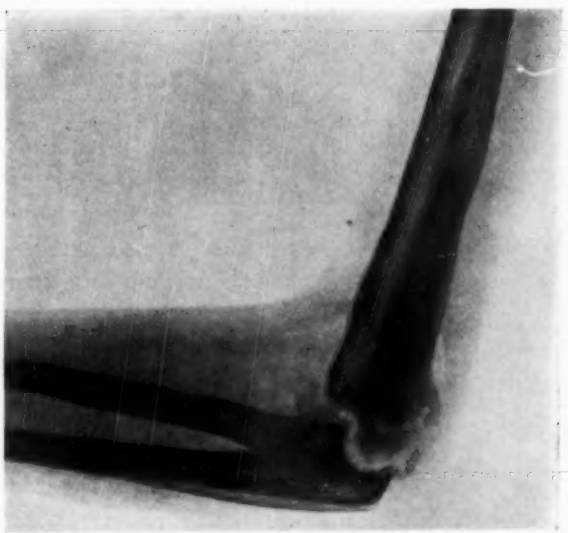

Fig. 5. March 31. New shaft well developed, but an almost complete absence of motion in the joint.

At the end of a year, when the danger of lighting up the old infection is less, she will return to have the joint mobilized and some of the scars resected.

This patient presented certain rather typical signs:

There was the quiescent incubation period of about three days, during which time one could not feel that the condition was in an altogether satisfactory state, and yet there was no indication for active intervention; and then the sudden bursting into flame of an extended process.

The color changes were characteristic: The bronzing of the skin (bronze erysipelas, as it has been called); the deep gangrenous blue of the muscle; the brown exudate, looking like disintegrated liver or chocolate; the odor, sweet but nauseating, like no other.

The infection in this instance was limited to the biceps, extending by way of its short head to the subclavicular region, but checked by the intermuscular septa and prevented from involving the posterior muscles of the arm.

In reviewing a case of this kind, where several therapeutic measures have been employed all of more or less uncertain value, it is natural to wonder what part each played in bringing about the result.

Long, deep incisions, to admit oxygen and to provide free drainage, alone might accomplish the cure. Since the War, however, the use of antiseptics in certain cases has received more widespread approval than before that time. The old notion that antiseptic solutions did more to damage the tissues and to impair their resistance than to inhibit bacterial growth, was upset by the researches of Carrel and Dakin. In the case under consideration, Dakin's solution could not be safely used. The incisions were so many that the skin between could not be protected from the corrosive action of the hypochlorite solution. Therefore, though the Carrel tubes were used, another oxidizing agent had to be substituted for the Dakin solution and the strength of the permanganate was arbitrarily fixed so that there was none of the accuracy used in the Carrel-Dakin technique. There is still the question whether the incision and the permanganate solution could have accomplished a satisfactory result without the use of the serum. This question recalls a case in which they apparently did.

About a year ago a boy aged about ten was admitted with a compound fracture of both bones of the forearm. The fragments were protruding and so badly soiled that it was necessary to scrub them vigorously with a a brush and Dakin's solution to remove the street dirt. He developed a gas gangrene on the third day and was treated with free incision and potassium permanganate solution, but received no serum. The progress of the disease was brought to an abrupt end. This was a mixed infection, however, and suppuration within the original area continued to be rather profuse. The parents were so shocked by a suggestion made in the beginning that an amputation might be necessary, that they lost confidence and removed the boy from the hospital to the safety of his home before any estimate could be made of the final functional result. We have heard that he uses the arm.

The antitoxic serum is pretty generally recognized to be of distinct value. Like all other sera, it acts best when given early. One writer treats all compound fractures as potential gas bacillus victims and gives them the serum upon admission. This appears to be a highly rational procedure.

Roentgenograms (Figs. 1–5) demonstrate the process that often takes place in fractures above the elbow in which satisfactory reduction has not been accomplished: The growth of a complete new shaft in the line of the elevated periosteum. The lower end of the old shaft has not shown the expected inclination to recede.

ORAL CHOLECYSTOGRAPHY*

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IN numerous communications published within the last two years we have advocated the use of the oral method of cholecystography and after an experience of over 2,000 cases we see no reason to reconsider our claims. In fact, as time goes on, we are more and more enthusiastic over the method, feeling that the diagnostic results are just as satisfactory as with the intravenous injection of the dye.

The great advantage of the oral method is that it is strictly an office procedure and does not in any way endanger the patient or require hospitalization.

It is interesting to note the following statement of Dr. Frank Lahey of the Deaconess Hospital, Boston:

> Preoperative diagnosis from cholecystograms was correct in 78 per cent of those using the intravenous method as compared with 92 per cent correct interpretations by the oral method.

Within the last six months a few important changes have been made in the oral technique. The dye as now dispensed in individual ampoules of 3.5 grams has been found to be so much improved in quality that it can be safely administered in plain gelatine coated capsules. The coating of the capsules with a solution of keratine has always been a troublesome procedure. The supply of keratine could not be relied upon; some would shrink the capsules while another batch would render them brittle. Investigations showed that only in rare instances did the capsules pass through the pylorus unbroken. These investigations proved that it was not necessary for the dye to reach the intestines in order to give satisfactory cholecystographic results. If it is true, as stated by the chemists, that the soluble tetraiodophenolphthalein sodium salt is converted into insoluble tetraiodophenolphthalein by the action of the hydrochloric acid in the gastric juice, then the probable explanation is that such an excess of the soluble salt is given that there remains after neutralization a sufficient amount to be absorbed by the gastric mucosa to render the bile opaque.

Before making this change in technique, the reaction in 100 cases using keratine coated capsules was compared with 100 cases using uncoated capsules. There was only a slight increase in the nausea, vomiting and diarrhea, certainly not enough to incapacitate patients in any way; they invariably appeared the following morning to commence their series. It is interesting to note that in the last 357 cases where uncoated capsules were used, 9.4 per cent had nausea, 11.5 per cent vomiting and 4.7 per cent diarrhea.

In order to obtain the best results in oral cholecystography it is recommended by the author that a standardization in technique be adopted. We strongly urge that it be based on Boyden's experiments on animals who found that the gall bladder becomes collapsed and empty from one to two and one-half hours after a meal containing an abundance of fat (the time to give the dye). The gall bladder then slowly fills for about eight to ten hours, full distention occurring about twelve hours after the meal (the twelfth hour observation). With starvation concentration then begins, the maximum point being reached four to five hours later (the sixteenth hour observation). To test the emptying power, lunch is then allowed and a further examination made one hour later (the eighteenth hour observation), when the gall bladder should be markedly diminished in size or have completely disappeared. A further study is made the following morning, thirty-six hours after the administration of the dye. At this time the gall bladder

* From the Roentgenological Service of the Lenox Hill Hospital.

shadow should have completely disappeared. This is the normal sequence in the average individual.

If this serial study is used we can be reasonably sure that any disturbance of these shadows has a distinct pathological significance. When the shadow as seen at the twelfth hour fails to become more dense four hours later, it indicates a lack of proper concentrating power such as we would expect in early mucosal changes. Failure to empty partially or completely after food, eighteen hours after the administration of the dye, would indicate a more extensive pathological condition involving the muscular structure of the gall bladder. A persistency of shadow up to the thirty-sixth hour after the dye would show a still more advanced pathology with a marked disturbance of function.

Of these three indirect signs of pathology of the gall bladder, probably the most valuable is the disturbance to the normal change in density between the shadow seen at full distention (twelve hours), when compared with that noted at the point of greatest concentration (sixteen hours). At least if we have any hope of making a diagnosis of early cholecystitis it must be based upon these findings.

Delay in emptying after food when observed is of great importance but we may have a cholecystitis of a considerable degree with or without stones which does not markedly disturb the emptying power of the gall bladder.

Most of the popular cholagogues such as bile salts, calomel, phosphate of soda, seidlitz powder and castor oil do not show any cholecystographic evidence of producing an emptying of the gall bladder. Pituitrin in some cases produced what was an apparent contraction of the gall bladder; later the shadow assumed about the size and shape seen before the drug was given. In other patients it had no effect on the gall bladder.

In four cases when 2 ounces of olive oil was given at the sixteenth hour and then studied for a period of six hours with starvation, there was very little emptying of the gall bladder as shown by the shadows.

At times 15 min. of oleic acid seemed to have a perceptible effect on the gall bladder although it never produced complete emptying. In other cases studied for six hours with starvation there was no change in the size of the shadow. In no instance did we observe an emptying effect from drugs as efficient as a chicken sandwich and a glass of milk.

Apparently food does not have to reach the duodenum to cause emptying of the gall bladder. Two cases who suffered a resection of the stomach where the food passed directly into the jejunum showed a normal gall bladder emptying as soon as the patient partook of the opaque meal consisting of 4 oz. of barium mixed in a pint of Zoolak.

Persistency of the shadow of the gall bladder up to or beyond thirty-six hours after the tetraiodo is given is usually a fairly reliable indication of an advanced cholecystitis. If the gall bladder disappears after food and again reappears at the thirty-sixth hour the diagnosis is questionable; it is then likely due to reabsorption of the dye in the intestines. At times we have a persistency of the shadow or a general retardation of the entire sequence in asthenic individuals whose general condition prevents them from emptying the gall bladder within the normal period.

While these indirect signs of gall-bladder pathology are not at the present time as reliable as the visualization of non-opaque stones, demonstration of deformity or failure to obtain a gall-bladder shadow, still we believe that with careful study in each individual case and with a standard for comparison we can recognize pathology in a high percentage of cases by disturbance of function alone.

In our entire series we have never encountered a case where the test proved to be contraindicated although it has been noted that patients who are suffering from jaundice do not take kindly to the dye,

and some neurotics become easily frightened if they should be unfortunate enough to have a reaction; in neither instance has the experience been at all serious.

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CANCER OF THE FACE*

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"THERE are many roads that lead to Rome." This is an old saying and very true. It may be used in almost every phase of life. Certainly in medicine there are various methods of therapy all of which, in the hands of reliable men, may give satisfactory results. The roads to be travelled in the treatment of cancer are several in number. The most successful at present are radiation and surgery. Radium and roentgen-ray therapy are the important standard methods of radiation.

The scalpel, used with proper "cancer surgery technique" in operable cases, is probably the best and safest road to follow. However, the galvanocautery, endotherm knife, electrocoagulation, electrodessication and the actual cautery may be used in certain cases for the destruction and removal of the lesion.

The growth, spread and life-history of the two main classes of cancer of the face are quite different. It depends upon the pathology whether the lesion is a squamous cell epithelioma or whether it is a basal cell epithelioma, commonly known as "rodent ulcer."

The squamous or prickle cancer cells break through the basement membrane early and enter the lymph vessels by which they are carried to the regional lymph nodes. From these nodes the cells may enter the blood stream and be deposited in any part of the body, distant from the primary lesion. The size of the primary lesion makes very little difference. Once the cancer cell has broken through the basement membrane we must consider the primary cancer and the regional lymph nodes to be the cancer field.

The basal cell epithelioma is also a malignant lesion. It remains localized, and does not tend to develop metastases in the regional lymph nodes. However, it is malignant in its habits and destroys the adjacent normal cells as it grows and spreads. Total destruction of the basal cell epithelioma should cure the lesion.

In this paper we will discuss only the basal cell type of epithelioma as it occurs in the face. This type of epithelioma almost always occurs above a line drawn from the angle of the mouth to the upper border of the pinna of the ear. However, one must never forget that rapidly growing lesions in this region may be squamous cell epitheliomas which do, at times, metastasize in the cervical lymph nodes.

The question is, which is the quickest, the safest, and the best road to follow in order to effect a lasting, permanent cure.

One should always point out to the patient the various methods of therapy which could be used. The advantages and disadvantages, as well as some of the dangers, of any method must be explained. A very small superficial skin epithelioma might be cured by mere curettage; or by radium or roentgen ray; or by the various electrical currents. Actual destruction by galvanocautery, if the lesion is small, is the surest and quickest method of destruction. The healed wound leaves an almost imperceptible scar.

The above may hold good for those lesions which lie in the skin over soft tissue parts but those basal cell epitheliomas which lie over cartilage or bone, and may be adherent to them, are the dangerous lesions. Radium and roentgen ray frequently fail permanently to heal those lesions. It is often difficult totally to destroy them with radiation and unless the destruction is total the cancer may recur even after some time of apparent cure.

Out of the wreck and ruin of a mountain

* From the Surgical Service of Dr. Carl Eggers, at the Lenox Hill Hospital.

village destroyed by an avalanche a new village may arise if only a few of the inhabitants survive. Exactly so with a cancer. If one destroys all the cells except two or three one has not eradicated the cancer. In time, out of the ruins, out of the scar tissue, these few cancer cells may break forth and develop into a new epithelioma, as large if not larger than the original lesion. The danger lies in the fact that this early recurrence cannot be easily detected, as the growth usually takes place in the depth and not on the surface of the well-healed scar. One cannot be certain that radium or roentgen ray has destroyed all the cancer cells of a lesion which may be adherent to cartilage or bone. Therefore that method is safest and surest which will totally destroy the lesion.

Larger lesions in which the galvanocautery cannot be used must, in our opinion, be treated surgically. The lesion with the adjacent cartilage or bone must be removed completely to insure a cure. Naturally such a procedure will often leave a large and ugly defect which will need to be closed by well-planned reconstruction surgery.

"Cancer surgery technique" is an ever present byword with those surgeons who operate frequently for cancer. Its teaching and adoption will in time improve the statistics of surgery in the treatment of cancer. It has been developed and its principles laid down to a very advanced degree by my honored chief, Dr. George H. Semken, on his service at The New York Skin and Cancer Hospital.

The avoidance and prevention of cancer-cell implantation before and during the operation, together with the total and safe removal of the lesion is the prime and only thought during the first stage of an operation for cancer. Only as a secondary matter comes the next stage, the reconstruction of the damage caused by the removal of the diseased tissue.

Every individual case must be carefully studied and planned before operation. Safe lines of section must be decided upon and the resulting defect visualized. It is best to make rough sketches and diagrams. The reconstruction work may then be properly planned and sketched geometrically upon the diagrams. Skin flaps may in this way be planned and cut to fit properly into a defect caused by the removal of diseased tissue. If such a definite plan has been mapped out and studied, and found feasible before operation, the actual carrying out of the plan is greatly facilitated. Small alterations in the procedure may be found necessary at the time of the operation but the basic plan will usually remain the same.

Patients must be restored to economic earning capacity and must be acceptable to society, no matter how severe or serious the operation has been. That is the second thought and phase of cancer surgery.

CASE REPORT

In January, 1927, H. T., female, aged thirty-eight was referred to me by Dr. Eric J. Ryan from the radiotherapeutic department of the Lenox Hill Hospital. Her husband had deserted her some years previously, just before the birth of her son, and she was now entirely dependent upon her own earning capacity to support herself and child. We felt that our responsibility was great.

She was suffering from a basal cell epithelioma of the left portion of the upper lip, the cheek, the ala of the nose, and a portion of the floor of the nose. She had been referred to the roentgen-ray department of the Lenox Hill Hospital by the skin department of the dispensary on November 27, 1925. At this time she had an ulcerating area on the upper lip about ½ in. in diameter. It was close to and involving the ala of the nose and was of four years' duration.

The first treatment of 2 erythema doses was given to the involved area including about ⅛ in. of apparently normal skin. She returned for inspection at the end of two weeks and at the end of one month the ulcer had healed with the formation of a flat scar.

She returned on July 26, 1926 with small recurrences at the angle of the nose and two near the outer periphery. The previous treat-

ment was repeated to each small area and again the condition cleared up.

On September 20, 1926 and on November

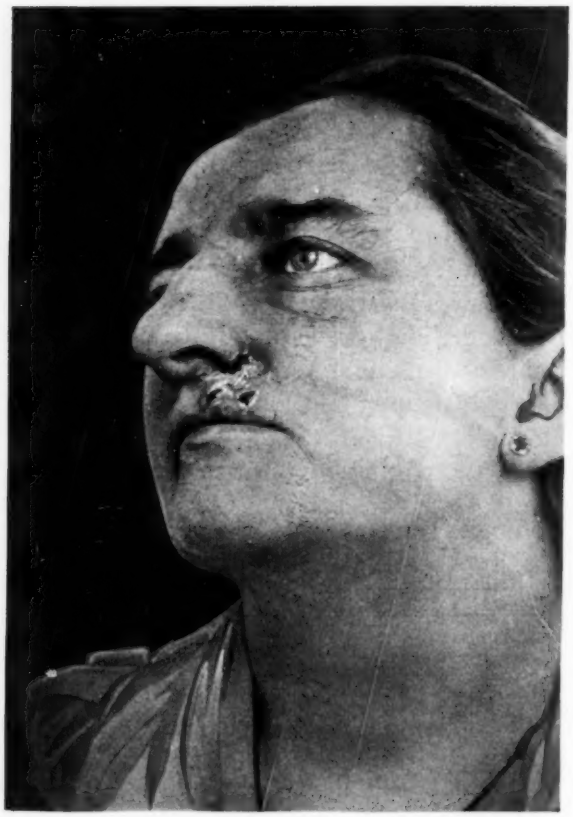

Fig. 1. Photograph of patient showing basal cell epithelioma of the lip, cheek and nose.

15, 1926 she was treated for recurrences in the crease of the nose. The last time the process was seen to be extending up into the nostril.

In referring the patient to me in January, 1927 Doctor Ryan, who had been observing her, stated: "It is relatively a simple procedure to clear up an epithelioma on the flat surfaces of the face, but much more difficult at the side of the facial creases, such as the inner canthus of the eye or the angle of the nose. Owing to the persistency of the lesion at the angle of the nose I deemed it advisable for the patient's sake to refer her to surgery for excision and plastic repair."

There is no question but that there are certain epitheliomas which are "ray resistant." Those specific cases could never be cured by radiation unless such massive doses were used that the result would be the same as if an actual cautery had been used. Therefore the wisest dictum to follow is: If properly large doses of radiation do not materially improve an epithelioma in six to eight weeks one can take it for granted that radiation will not entirely cure the lesion and other methods must be resorted to without further waste of valuable time. The borderline has been crossed, and surgery must be employed.

General physical examination of this woman revealed nothing abnormal. Her heart, lungs and kidneys were normal. The blood Wassermann was negative. There was no evidence of tuberculosis.

Study of the case showed that the tissue which would have to be sacrificed consisted of: The left portion of the columella with the anterior left portion of the septum with cartilage; the anterior portion of the floor of the left nares; the entire thickness of the lower portion of the left ala; the adjoining portion of the cheek and the left half of the upper lip from the mid-line almost to the angle of the mouth; the vermilion border with a portion of the adjoining mucous membrane; also, the full thickness of the lip had to be sacrificed except for the inner mucous membrane (Fig. 1).

The reconstruction of the ala was planned by taking a tongue flap from the cheek with the pedicle above partially on the nose and the cheek as shown on the diagram (Fig. 2). This flap would have to be swung mesially with the skin on the outside and a Thiersch graft would be placed on the inner side.

The upper lip and cheek defect, resulting from the excision of the lesion and the taking of the flap for the ala, would have to be closed by making use of a pedicle flap comprising practically the entire left cheek with the pedicle above where the infraorbital vessels emerge to nourish the flap. By using a very large flap comprising practically the entire cheek the scar line was brought posteriorly on the side of the cheek where it was not so readily visible when looking at the patient *en face* (Fig. 3). There is no question that the larger the flap, the more courageous the plan, the better will be the cosmetic effect. The temporary defect in front of the ear was planned to be at once covered with a Thiersch skin graft. This graft would be excised later when a linear suture could be made.

With the above plan to follow the patient

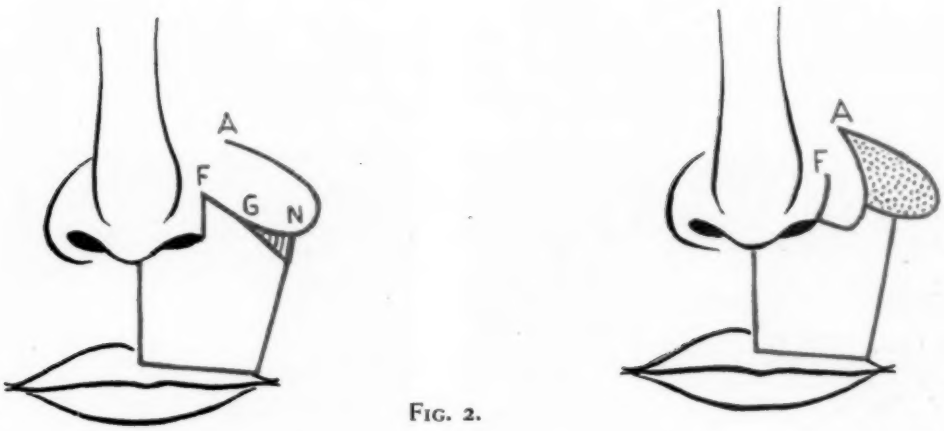

FIG. 2.

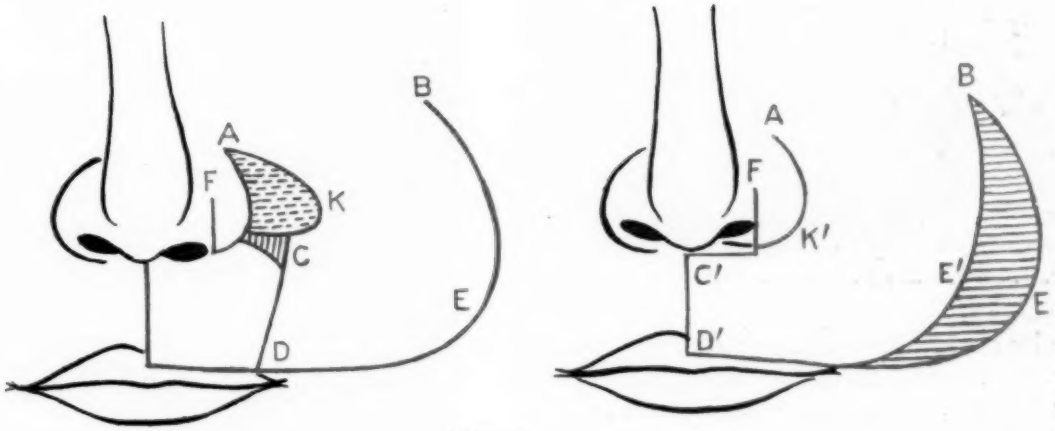

FIG. 3.

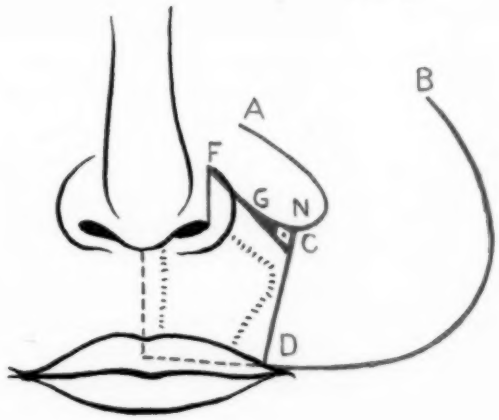

FIG. 4.

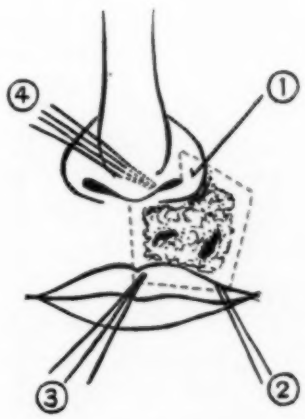

FIG. 5.

FIG. 2. Diagram showing plan for the reconstruction of the ala of the nose.
FIG. 3. Diagram showing plan for the reconstruction of the lip and cheek.
FIG. 4. Composite diagram showing entire plan for reconstruction of ala, lip and cheek.
FIG. 5. Diagram showing how the specimen is marked with one (1) to four (4) black silk threads so that pathologist can orient and intelligently report on specimen. 1, ala of nose: 2, outer margin of lip excision; 3, inner margin of lip; 4, floor of nose. This diagram goes with specimen to the laboratory.

was admitted to the Surgical Service of Dr. Carl Eggers at the Lenox Hill Hospital. The operation was performed on February 9, 1927,

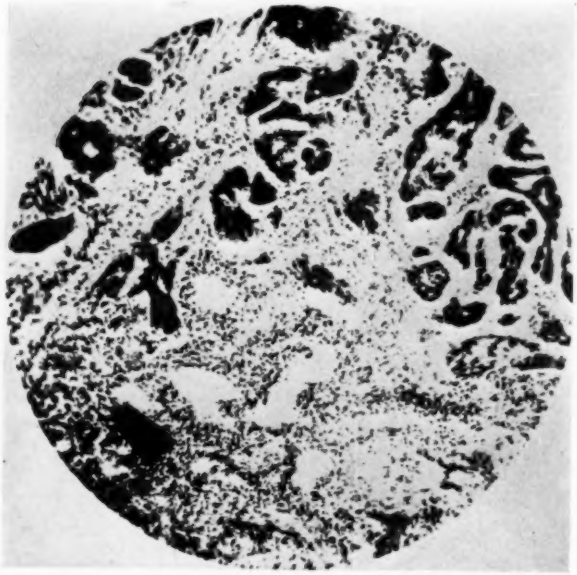

Fig. 6. Photomicrograph of basal cell epithelioma of lip.

under 5 oz. ether-oil colonic anesthesia, the ideal anesthetic for these types of cases. We can never be grateful enough to Dr. James T. Gwathmey for his part in making colonic anesthesia safe and practical. Since lip, cheek and nasal

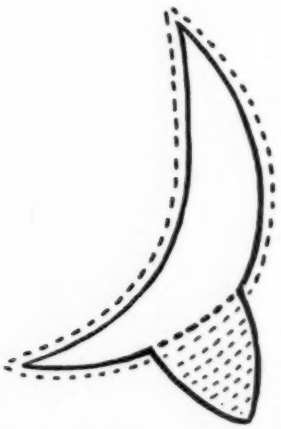

Fig. 7. Diagram showing the excision of the Thiersch skin graft and the excision of the miter of skin on the one side in order to equalize the length of the two wound edges.

work had to be done, it certainly was a tremendous aid to be free of anesthetist's apparatus and still have the patient quietly and peacefully asleep.

A post-nasal plug was inserted and the technique as planned was carried out. "Cancer technique" was rigidly observed. The surface of the lesion was primarily cauterized and carbonized with the Paquelin cautery to prevent

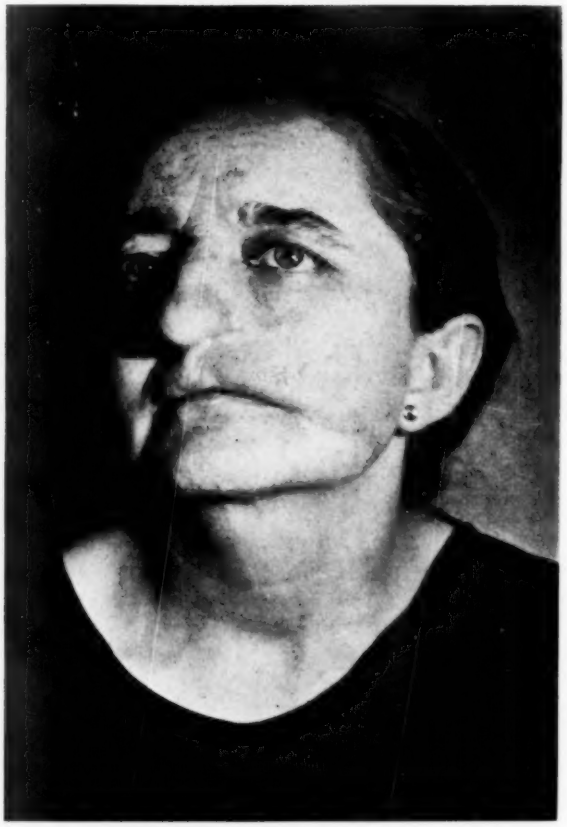

Fig. 8. Photograph of patient taken one and one-half years after the first operation.

cancer cells from being smeared and implanted. An instrument or forceps used to grasp the tumor side of the lesion was never used on the tissue side. Hemostats once placed were not used again without being resterilized in order to destroy any possible cancer cell which might have become adherent.

The plan of procedure worked out satisfactorily. All remaining raw surfaces were covered with a Thiersch skin graft, namely, the inner side of ala flap, the floor of nose and the raw surface of the septum and the defect in front of the ear. A small rubber tube surrounded with iodoform gauze was placed in the nostril to act as dressing for the grafts. The other suture lines were dressed with wound shellac and a light gauze dressing was applied.

The convalescence was uneventful and the patient was discharged from the hospital with all the wounds healed on the fifteenth postoperative day. The initial cosmetic result was such that she could return to work at once.

The specimen was carefully marked with various number black silk threads at the time of operation (Fig. 5). This was done so that, with the diagram, the pathologist might recognize, orient and understand the specimen. Thus he could give an intelligent report not only as to the pathology of the lesion but also as to its extent and the safety of excision. Only in this way can a fair prognosis be determined.

The report of the pathologist was as follows:

Sections obtained from various parts of the lip show a basal cell epithelioma of ordinary structure which contain a few small nests of squamous epithelium. The skin over the tumor is ulcerated in several places; in other places it is necrotic, while in still other places its shows hypertrophy and hyperkeratosis. The superficial part of the tumor shows areas of degeneration and other areas in which the tumor cells are largely destroyed. The degeneration is often associated with fibrosis and hyaline changes in the stroma. The bulk of the tumor is superficially placed though the deeper muscular tissues are infiltrated in many areas. The floor of the nostril is invaded a short distance and the ala of the nose is involved. In none of the sections does the growth extend to the line of incision (Fig. 6).

The prognosis therefore was satisfactory.

On May 2, 1927, which was about three months after the first operation, a revision operation was performed under 4 oz. of colonic anesthesia. The elliptical Thiersch graft on the side of the cheek was excised and the skin edges undermined so that the skin could be sutured by linear suture line. In order to equalize the length of the two sides of the defect a little miter of skin had to be excised from the outer wound edges as shown in Figure 7. Thus a smooth suture line was obtained without buckling. The ala flap was also revised and made to fit more exactly into the lip and cheek flap.

On February 8, 1928 the patient was readmitted and under local anesthesia the vermilion border of the scar was incised, about ¼ in. of excess skin of the lip flap was removed and a good portion of the subcutaneous fat was excised in order to make a thinner lip. A careful suture was made.

It is now one and a half years since the removal of the cancer and the patient is entirely symptom-free. The cosmetic result is a satisfactory one and she is working hard and is happy earning her living (Fig. 8).

CONCLUSIONS

1. Basal cell epitheliomas must be totally destroyed and 100 per cent eradicated in order to cure them.

2. The safest and surest methods are the galvanocautery, if the lesions are small and overlying soft parts, and surgery, if they are more extensive. This is especially so if the lesion overlies cartilage or bone as in the nose or ear. In these cases the cartilage or bone must be removed in many instances in order to cure the epithelioma.

3. If surgery is employed proper "cancer technique" must be used in order to prevent implantation of cancer cells during the operation.

4. There are two stages in a cancer operation. The first is the total radical excision of the lesion, and the second, the reconstruction operation for the repair of the damage done by the excision of the cancer.

5. The two stages must be most carefully planned before the operation by making diagrams and proving geometrically the feasibility of the plan.

6. Colonic anesthesia is the choice in these cases if local anesthesia is impossible.

7. Specimens must be carefully marked with black silk threads so that the pathologist may report not only on the pathology of the lesion but also on the safety of the excision. This will determine the ultimate prognosis.

INTRAUTERINE AND EXTRAUTERINE PREGNANCY

FRANK R. OASTLER, M.D.

NEW YORK

MRS. J. T., aged twenty-eight. One child born normally five years ago. Previous history of acute nephritis which, however, did not appear during pregnancy. Two years ago patient had a miscarriage at about two months, self-induced. No curettage followed this miscarriage. Patient suffered from menorrhagia and metrorrhagia with backache for several months. Patient has been in good health, however, for a year prior to present illness.

Present Illness. Patient skipped one period. Ten days later she was seized with sudden sharp pain in left lower quadrant at night. Morphine and castor oil were administered with relief. Temperature and pulse were normal. Patient was up in two days but tenderness in left lower quadrant remained. There was no uterine bleeding.

Another attack of a similar nature occurred three days later, associated with vomiting. Same treatment was given, then the patient consulted me.

Pelvic Examination. Revealed nothing abnormal. The uterus might have been slightly enlarged. There was no softening and no bleeding. Ectopic pregnancy was suspected and the patient was sent to Lenox Hill Hospital where she remained for five days under observation. Nothing happened. She was allowed to go home and her physician was advised to watch her carefully. Three days later another mild attack occurred. There was no uterine bleeding. For the next week patient was up and apparently well. Then at 3 o'clock A.M. another attack occurred when the patient became faint and all the symptoms of severe internal hemorrhage appeared. There was no vaginal bleeding. She was rushed to the Lawrence Hospital at Bronxville and an immediate operation performed. The abdomen was found to be filled with blood and a left sided ectopic gestation of about two months' duration was removed. The uterus was somewhat enlarged and soft.

The patient was transfused and 500 c.c. of blood given. There had been no vaginal bleeding at any time. Convalescence was stormy but not unusual except for constant nausea. Patient was up on the fourteenth day.

Pelvic examination showed an enlarged uterus and soft cervix. Intrauterine pregnancy was suspected. Patient went to her country home in northern New York. She was told that she was pregnant and her physician kept her under observation. Unfortunately at about five and one-half months she aborted, without complication. She is at present in good health.

This case is of interest, because of the double pregnancy, extrauterine and intrauterine, both evidently beginning at the same time, because of the absence of uterine bleeding until the final abortion at five and one-half months and because of the difficulty of diagnosis.

*Case Report, from the Gynecological Service of the Lenox Hill Hospital.

PREGNANCY AND HEMORRHAGE INTO AN OVARIAN CYST*

FRANK R. OASTLER, M.D.

NEW YORK

MRS. F. A. A., aged thirty-one. One child born five years ago without incident. Menstruation began at thirteen years, thirty days type, formerly of four days' duration, of late, only two. Amount diminished. Operation two years ago, right ovarian cyst removed. Has been well since operation.

Present History. Menstruation was due three weeks ago, but did not appear. Two days ago patient was seized with sudden cramp-like pain in left side of abdomen, low down. Became faint and vomited. A physician was called who administered castor oil and a hypodermic of morphia. Two hours following the onset of pain the patient began to menstruate. Irregular spotting of blood, pain and tenderness on left side have continued to date. Bowels moved with the castor oil but not since. No further nausea.

Physical Examination. Abdomen somewhat distended with gas throughout. No apparent rigidity. Very tender in left lower quadrant. Blood count of 4,800,000 red cells, 14,000 white cells, 78 per cent polymorphonuclears. Temperature 100°F. Pulse 90.

Vaginal Examination. Slight pelvic relaxation. Uterus somewhat enlarged, soft, not tender. Cervix soft. In the region of left adnexa there is a soft mass the size of a small orange very tender and apparently fixed. The mass is well defined. Cervical tug causes considerable pain.

Provisional Diagnosis. Ectopic gestation.

Operation. Median incision. Pelvis contains considerable serosanguineous fluid. In the region of left adnexa is a mass, evidently the left ovary, size of a small orange, black and copper in color, cystic. The tube is congested but patent. The mass proves to be a small ovarian cyst, containing fresh blood. This with the tube was removed. The uterus was enlarged, soft and dark in color. Abdomen closed.

Twenty-four hours following operation vaginal bleeding ceased. The patient had an uneventful recovery, except continued nausea and gas.

Three weeks following operation a pelvic examination was made. The uterus was found to be enlarged, soft with considerable softening of the cervix. Patient still complained of nausea and inability to regain her strength. She was taken to Atlantic City for three weeks and on her return still complained of indigestion. On examination a positive diagnosis of pregnancy was made. Nausea was relieved by milk of magnesia, milk of bismuth and carbolic acid.

At the sixth month period patient bled slightly for one day and was put to bed, otherwise her ante partum history was negative. She gave birth without incident to a healthy male child, weighing 6 lbs. 12 oz. Child was born about ten days ahead of the approximate date.

Post-partum History. Negative. Patient nursed her child until the seventh month. She has never menstruated since. The child is now twenty-two months old.

The case is of interest from a point of differential diagnosis and because it shows that pregnancy can continue to term without the presence of ovaries.

*Case Report, from the Gynecological Service of the Lenox Hill Hospital.

LARGE RENAL CALCULUS

REPORT OF A CASE

HENRY A. R. KREUTZMANN, M.D.

SAN FRANCISCO

SINGLE renal calculi of large size are not very common. The majority reported vary in weight from 30 to 160 gm.

We have been able to find only nine cases in the literature where single stones weighing over 300 gm. have been removed. The largest renal calculi that the human body is capable of producing have been found at autopsy, where stones have been discovered weighing 1500 to 2000 gm.

Author	Weight, gm.	Unilateral	Bilateral	Age	Sex	Result
Christian	460	.....	Yes	22	M	Well
Grave	340	Yes	.....	49	F	Well
Johnsen	339	No mention	No mention	52	M	Well
Morrison	1130	.....	Yes	50	M	Well
Mylvaganan	1440	No mention	No mention	50	M	Died
Pearson	900	No mention	No mention	60	M	Died
Sheild	495	No mention	No mention	39	M	Well
Ward	555	Yes	.....	22	..	Well

The largest single calculus removed by operation was reported by Mylvaganan. This stone weighed 1440 gm. It is extraordinary that this patient did not suffer any inconvenience until six months before the operation; the symptoms then complained of were pain in the left side associated with a rapidly growing tumor.

One would believe that at present with our modern methods of diagnosis, operations would be performed early before renal stones had attained enormous size. Yet, five of the nine cases reported occurred during the past ten years. Possibly the reason is that patients do not seek medical relief until the symptoms become so severe as to make life unbearable.

In analyzing these nine cases several interesting facts are noted. One would expect such large stones to form slowly and appear late in life. Yet two of the patients were twenty-two years old and a third was thirty-nine. In our case the patient was twenty-nine years old.

The impression is quite common that stag-horn or large calculi are the result of some metabolic dysfunction and that they are usually found in both kidneys. In five of the patients to whom reference is made as to the condition of the opposite kidney, three were found to have no calculi on the good side. This was also the case in our patient.

One may infer that unilateral calculi are the result of infection or stasis, or a combination of these two conditions. This supposition is strengthened in our own instance by the fact that there was a history of a prolonged infection of the ear in childhood.

CASE REPORT

G. C. H., Male, aged twenty-nine. Family history, negative. Past history, scarlet fever when four years old. This was complicated by a discharge from the left ear which continued until he was seven years old. The patient had nocturnal enuresis up to the age of eleven. Gonorrheal infection in 1920 which was followed by a left epididymitis.

Present Illness. The onset of the present illness was first noted three years ago. It began with a dull pain over the left kidney,

most marked on lying down. It was relieved by turning on the left side. The pain was not constant, but occurred at intervals of four to

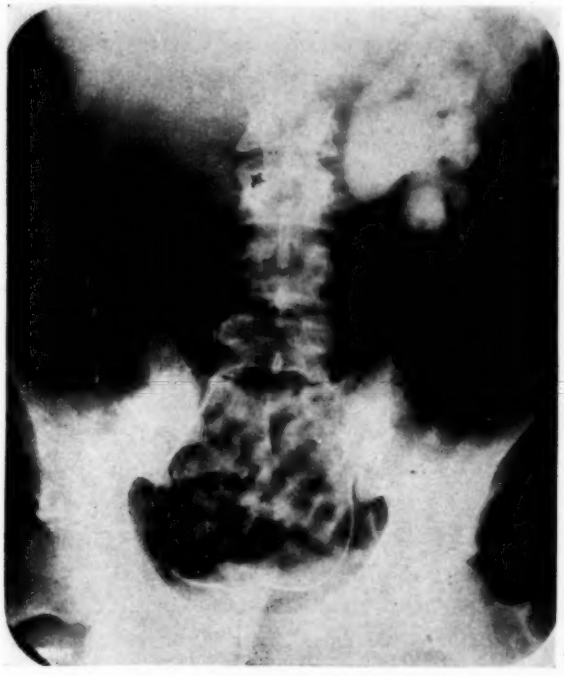

Fig. 1. Large renal calculus.

six weeks and lasted two or three days. During this period the patient felt tired and had no strength or appetite. At times he had pain in the left chest which was worse on deep breathing. Associated with this there was soreness over the left back when the patient raised his left arm or bent over. For the past two years the pain in the left kidney was noted when walking. There never was any referred pain along the course of the left ureter or down the left thigh. Urinary symptoms did not begin until two years ago. The patient then began to have frequency, voiding every two hours during the day and three or four times at night. There was also some urgency and dysuria. These symptoms have continued up to the present time. There has never been any hesitancy, ureteral colic or passage of stones or gravel. For the past year there has been hematuria on four different occasions, never for more than a day. During the three months before operation the patient had frequent attacks of sharp, colicky pains in the region of the left kidney lasting from ten to fifteen minutes. There has been marked loss of weight.

Physical Examination. The patient is a tall, emaciated young man with a pasty, sallow complexion. The left kidney is distinctly palpable over its lower half. It is greatly enlarged, very hard but not nodular. The lower

Fig. 2. Photograph showing calculus in relation to the renal parenchyma.

pole is about 2 cm. above the crest of the ilium. The kidney is freely movable and little pain is produced on deep pressure. There are some crackling râles at the base of the left lung. Otherwise physical examination is negative.

Urinalysis. Amber, cloudy, alkaline, urine, specific gravity 1011, albumin present, no sugar. Microscopic examination shows urine to be loaded with pus and red blood cells.

Blood Count. Red blood cells, 3,900,000. Hemoglobin 75 per cent. White blood cells, 21,000 with 76 per cent polymorphonuclear leucocytes.

Kidney Investigation. Cystoscopy shows moderate inflammation of the trigone; otherwise the bladder mucosa is healthy. The ure-

teral orifices are normal. Pus can be seen issuing from the one on the left side. No. 6 ureteral catheters were inserted to both kidneys without difficulty.

	R. K.	L. K.
Pus cells	1–5	150–250
R.B.C.	2–5	100–150
Culture	Neg.	B. coli
Phthalein test	Percentage,	Percentage,
App. time	4 min.	12 min.
1st 15 min	21	0.5
2nd 15 min	8	1.1
Total	29	1.6

Roentgenograms showed an extremely large stag-horn calculus involving the dilated calices and pelvis of the left kidney. No evidence of stone on the right side.

Operation. Gas and oxygen anesthesia. A long curved incision was made extending far forward anteriorly over the anterior superior spine. There was very little muscle tissue and the lower pole of the kidney was readily exposed. No perirenal fat was noted. The capsule was thickened, edematous and traversed by many large veins. Few firm adhesions were encountered. Great difficulty was experienced in delivering the kidney owing to its large size. The ureter was identified. It was only slightly thicker than normal. On putting traction on the ureter a tear occurred in the friable kidney pelvis and pus escaped into the wound. The ureter was freed down to the brim of the bony pelvis, ligated and cut. This permitted still further mobility of the kidney. By taking advantage of every bit of space at the lower end of the incision, the kidney was finally brought out of its bed. Two renal clamps were now put on the pedicle without difficulty. Because of the large stone in the pelvis, it was impossible to cut off the pedicle beyond the stone and so in removing the kidney the pelvis was laid wide open by cutting it off near the kidney. After removal of the large kidney mass, the excess of pelvic mucosa was trimmed off near the outer clamp. The pedicle was doubly ligated and the wound was closed with mattress sutures. Two cigarette drains were inserted to the kidney bed. The patient made an uneventful recovery and was out of the hospital in twenty days.

Pathological Report. The specimen consists of a large kidney 15½ cm. in length, by 9 cm. in width, by 6 cm. in thickness. It is filled with large stones one of which is protruding from the pelvis. The total mass weighs 650 gm. There is also a separate piece of pelvic tissue which when spread out covers an area of 5 by 2 cm. The large stone extends into all calices and their ramifications. It is fractured in three separate places, thus giving the appearance of multiple calculi. Some of the calices are obliterated beyond the stone and contain blood-tinged purulent material. The actual kidney substance varies in thickness from 0.4 to 1.5 cm.

Microscopical examination shows the kidney substance to be infiltrated with pus and round cells. The stone is composed almost entirely of uric acid.

In all cases where we have had to deal with large kidneys it has been our aim to remove them without resecting the last rib.

Soiling of the wound, caused by tearing of the friable infected renal tissue, is not uncommon. In fact it is most difficult to remove an enormous kidney filled with stones and pus without producing a laceration through which the infected material escapes into the wound. Fortunately this is not serious. The patient, having had this infection for years, has a high resistance to the particular organisms present. With proper drainage the wound will heal rapidly.

The greatest difficulty when resection of the rib is not performed is to deliver the enormous renal mass out of its bed. This may be complicated by the presence of firm, vascular adhesions which are usually most pronounced about the upper pole. The first step is to free the kidney on all sides by patiently clamping and ligating the adhesions en masse. Additional space can be gained by carrying the lower end of the incision far anteriorly over the anterior superior spine.

Great caution must be exercised not to cut the peritoneum which bulges into the wound at the lower angle of the incision. It can be pushed away either with gauze or, better yet, with the fingers of one hand which act as a guide so that the muscles

can be cut transversely without danger of opening the peritoneal cavity.

Early ligation of the ureter increases the mobility of the kidney and facilitates its delivery out of the wound.

If these various points are observed, rib resection is rarely necessary and complications which may arise from a tear in the pleura are avoided.

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TRAUMA AND DEVELOPMENT OF BONE SARCOMA*

PHILIP STEPHENS, M.D., F.A.C.S.

LOS ANGELES

THAT trauma plays some part in the production of, or at least the stimulation of, activity in malignancy, we, I believe, will all agree.

That continuously applied trauma—trivial as it may be—may produce or stimulate malignancy, we also are fairly well agreed.

But now the question is, does any one act of trauma, any one blow, contusion, or short application of force, either mild or severe, produce a new growth, and especially bone sarcoma?

Since our compensation laws have been enacted there is a marked tendency to attribute all the ills that flesh is heir to to trauma in some form, obviously associated with industry.

The average surgeon of today is far too ready to accept a history of trauma from the patient or his chart without a careful investigation and in so doing fails in his duty to science, and in assisting to solve an important medicolegal question which will later arise and which must be settled by those who are honestly attempting to do their duty in properly applying these laws for the protection of the industrial worker.

While we are compelled to admit that in the majority of cases of bone sarcoma there is a history, definite or indefinite, of an exciting act of trauma, we are strongly of the opinion that if the history is carefully sifted and investigated we will find little grounds for the assumption.

We do often get a history of a slight blow which is sustained at the site of the well developed tumefaction which first attracted the patient's attention to the condition, and the story of the act of trauma so often repeated, with the history, that in the patient's mind and that of his family and friends at least, it is the actual cause of the serious condition in the process of active development.

I repeat, however, that if the history at the time of suspected onset of sarcoma or any other malignancy is carefully gone into, we will in the majority of cases find that the character of the trauma was too slight to produce any organic change in the tissue or to have any tendency to set up the irritation required to encourage cellular activity necessary to tumor growth—certainly not skin or periosteal hematoma, or any macroscopical tissue change.

While the nature and characteristics of sarcomatous growth have been fairly well worked out at the present time, thanks to the many able investigators and cooperative investigations made in the last few years, still we are far from the solution of the actual cause of the disease, and until the actual cause is discovered we cannot hope to get a clear understanding as to what effect, if any, trauma has on its development.

We are rather inclined to be a little ashamed of what the Virginia Court of Appeals chooses to term in a recent decision "only medical theories." To quote:

"The Supreme Court of Appeals of Virginia, in affirming an award of compensation under the workmen's compensation act for the death of an employee from sarcoma after an injury to his right side, says that whatever view the court might take of the medical opinions, they were frankly and at best but theories. Taking them as they were in connection with the facts narrated, however, and taking a common sense, practical view, as courts and commissions must take of the ordinary happenings of life, boiled down to its last

* Read before the Los Angeles Surgical Society, January 13, 1928.

analysis, the medical theory is that there is a relationship between the receipt of injury and origin of sarcoma, and that the degree of injury plays no important part. With this in mind, the court finds that a perfectly healthy, strong man, who has never lost any time from work or complained of any illness, suffers an injury and from that time on is incapacitated; he grows worse and worse, and sarcoma develops at the point of injury, from which he dies. The lay mind, under such circumstances, can reach no other conclusion than that reached by the industrial commission; namely, that the sarcoma was either caused by the injury or was aggravated by it. As the chairman of the commission well said:

"'The general rule clearly to be adduced from the decisions in this type of case is that if the facts show a causal connection between the injury and the development of cancer, then the two cannot be separated and the victim of the cancer is entitled to compensation. It frequently appears in the reports of these cases that the doctors disagree as to the probable connection between a blow and the development of cancer, but from the standpoint of the compensation act, where a workman is apparently healthy, as was the case here, and able to perform his regular work, and immediately following a severe blow a condition sets up which later turns out to be cancerous, the commissioner believes that the connection between the blow and such development is clear.'

"To this the court may add that the courts have in general found no difficulty, in cases similar to this one, in applying the ordinary rules of evidence, and in drawing the ordinary conclusions of cause and effect from established facts, and this court finds none. This, the court doubts not, courts will continue to do with a full sense of justification and without apology until the cause of cancer is definitely and scientifically established."

Our literature is filled with reports of clinical and pathological investigations dealing with this question: Lowenthal in 1875; Gross in 1897; Coley in 1898.

But this literature, although voluminous, is by no means convincing. In the recent article of Mock and Ellis[1] the statement is made:

"The turning point was reached in evaluating the factor of trauma when Von Brenger proposed the standardization of the statistics regarding trauma, and obtained reports from many large German clinics for the five-year period which included an accurate statement of the number of cases in which the tumor could be attributed with certainty, or with a probability of certainty, to a single severe trauma, the character of this trauma being accurately stated or proven. All of which led up to the present medicolegal view of the question, the rules for such cases being as follows:

"1. Credible proof that trauma was sustained must be brought or shown by legal investigation.

"2. The accident must have been of a nature that makes probable the injury of a part later affected by a neoplasm, though it need not have acted directly upon it.

"3. The accident and the intermediate or premonitory symptoms of malignancy itself must bear a close relationship to one another.

"4. The tumor which is attributed to trauma must have developed subsequent to the injury and at a time which makes probable a causal relationship, due consideration being given to the pathology and clinical type.

"In the rather chaotic condition of our American laws there has been no effort made to standardize our views and give our commissions and courts some uniform rules by which to judge these cases. Dr. Mott has, however, drawn certain postulates for those cases which have a legal aspect and, in my opinion, covers the entire question:

"1. Reasonable proof of trauma:

[1] Mock, H. E. and Ellis, J. D. Trauma and malignancy. *J.A.M.A.*, 86: 257, 1926.

"(a) Injury must be reported within a reasonable time after the accident.

"(b) The examination and condition of the traumatized tissue to be reported by a physician within a reasonable period after the injury.

"2. The developed neoplasm must be at the same site as the original injury and must involve some of the tissue which without reasonable doubt could have been involved in the original trauma.

"3. Definite evidence must be produced to prove that no neoplasm previously existed.

"And here let me quote Bloodgood as saying that 'In my own group of over 1000 bone tumors, of which perhaps 400 are bone sarcoma, I have but two cases in which directly after the injury a roentgenogram was taken showing a negative bone.'

"4. In addition to the history of trauma there must be a history of certain bridging signs linking the injury, such as persistent pain, swelling, unhealthy wound, or anatomic functional disturbance."

They finally conclude by saying there is no justification for assigning trauma as the etiologic factor in any particular case unless this can be proved with scientific accuracy. In the great majority of cases commonly reported as the result of trauma such an etiology cannot be scientifically established.

In my humble opinion there has been no clearer view presented on this question recently than that of Dr. Kolodny in his article compiling the work of the American College of Surgeons' Registry of Bone Sarcoma. Without doubt he has "brought much light in the dark field of malignant bone tumors." He says of the etiology of bone sarcoma:

"The etiology of the group of bone tumors known as bone sarcoma has frequently been linked with trauma. Whatever the personal view of the investigator as to the etiology of tumors in general may be, it cannot be denied that trauma seems to be frequently associated with the origin of bone sarcoma. Because of the wide difference in definition of trauma by various pathologists, the literature is discrepant in statistics about the clinical incidence and the etiological importance of trauma. The leading question suggesting itself is: 'What is the relation between the trauma and the appearance of the tumor?' Refraining from a discussion of the many hypotheses of purely philosophical nature which lack actual basis, I will outline here the belief to which one is inclined after a study of the osteogenic sarcoma group of the Registry material.

"In studying a large series of osteogenic sarcoma one cannot fail to be impressed with the fact that all instances of this tumor may be arranged in series in such a way that at one end will be a mass resembling callus, as we see it after fracture, and at the other a most cellular, highly malignant looking osteogenic sarcoma. Cases of osteogenic sarcoma may be identified when the bone absorption, new bone formation, and the vascularity can hardly be told from callus in various stages of bone repair. This observation leads one to believe that the development of osteogenic sarcoma is guided by the same principal laws of growth that are usually observed in the animal organism when in the stage of natural growth or when repair and regeneration are on hand. The main and important specific condition required for the development of an osteogenic sarcoma is a stimulus to growth.

"From the fertilized ovum the growth capacity is transferred to the animal tissue cells. As long as the organism is in a stage of physiological development, the cells grow without additional stimuli from the outside. But when the growing organism has reached its adult age, the terminal stage of physical development, the growth tendency of the tissue cells is rapidly interfered with, so that no advance growth is possible. It is a result of what is known as 'growth restraint.' The enormous role of growth restraint is easily understood when one thinks what would become of

the animal organism if growth were not interfered with. The tissue cells in adult organisms do not lose their growth abilities, the latter having merely changed from actual kinetic to potential. On this potential growth ability of tissue cells is based the whole process of tissue regeneration and repair. No life would be possible if the potential growth ability of tissue cells to multiply when repair is needed were lost. Trauma with the consequent necessity of repair leads to a temporary change of the growth ability from potential to kinetic, i.e., it leads to a temporary elimination of growth restraint in the traumatized region. In some instances in the presence of rare predisposing factors which are not understood, trauma may lead to a complete loss of growth restraint in the injured organ. The physiologically accelerated regenerative processes may lead them to a violent multiplication of mesoblastic cellular elements which have entirely lost their main object, physiological repair. The continuous multiplication of as yet undifferentiated cells may be followed by dissemination throughout the organism and by the whole characteristic picture of metastasis of a malignant growth. Regeneration and repair are the main but not only effects of trauma, which have some relation to the etiology of tumors. Separation and isolation of cell complexes, hemorrhage with consequent absorption and encapsulation, necrosis of tissue—these all play an important part in the etiology of mesoblastic tumors, when brought together with predisposing factors.

"Thus it is believed that sarcoma of the bone is frequently a result of a loss of growth restraint following an accidental or occupational trauma to a previously normal bone or a surgical trauma to an existing benign bone tumor growth. Not infrequently when the tumor appeared immediately after the trauma or when the primary tumor was noticed after a trauma but not long before a generalization of the disease was seen, it is probable that the tumor existed long before the trauma and the latter merely led to the discovery of it or an exacerbation of its growth. The mooted question, not how often sarcoma has a trauma history but how frequently a trauma is followed by sarcoma, adds to the discredit of the importance of trauma as an adjuvant etiological factor in an organism predisposed to blastomatosis."

There are few cases of bone tumor in which there is not some history, obscure or otherwise, of injury. It is not my purpose to cite or record cases in point, as they are extremely frequent and do not add to our meager knowledge of the question. I must, however, cite two which are rather similar clinically, but differ pathologically, and, for that reason, terminate differently.

CASE REPORTS

Case 1. The first is that of a young girl of sixteen, who, while working as a cash girl in one of our large department stores, developed a pain and stiffness of the left knee, attributing it to either being on her feet constantly or to striking the outer side of the knee (proximal head of the fibula) against something in the course of her employment. She had been treated by two different chiropractors for the six months previous. Inasmuch as her condition was growing gradually worse, she was referred to me by her local physician. My examination showed a definite swelling over the proximal head of the fibula.

Roentgenograms showed characteristic bone changes indicative of a new growth along with a pathological fracture, and I advised immediate amputation. Dr. John Wilson saw this case with me and concurred in my diagnosis of bone sarcoma. Amputation was done. The pathological report was as follows: The tumor is made up of large cells. Some are round or polyhedral, but the majority are somewhat elongated and may be called spindle shaped. Nuclei are hyperchromatic; many mitotic figures are seen. There is a considerable amount of intracellular substance. Many small areas of osteoid tissues are scattered through it.

Diagnosis: Large spindle cell sarcoma, probably from periosteum.

This girl made a rather stormy recovery. Result, however, was a good stump, which after a year was fitted with an artificial limb.

At the present time (five and one-half years after the amputation) there is no evidence of metastasis in chest or elsewhere. She is leading a normal, active life; she is a music teacher, drives a small automobile. Possibly she will have no recurrence.

Case II. A case far more illustrative is that of a vigorous young man of nineteen, who came in last June with a swelling of the head of the left tibia toward inner side, in which there was a history of his noticing a small swelling and slight discomfort at this point two months previous after he had spent a rather strenuous day using a wheelbarrow. He thought he had struck the knee against the wheelbarrow but was rather uncertain on this point and could not say definitely that he had or had not contused the limb.

Roentgenograms showed definite beginning bone changes indicative of sarcoma. A section was taken by the Percy cautery, and this specimen was examined by Drs. Brem, Zeiler & Hammack, showing more spindle cells than polyhedral or multinuclear giant cells. Mitotic figures very numerous.

A roentgenogram of the chest showed no evidence of metastasis. The leg was amputated at the junction of the lower middle third of the thigh. Three months later he was again referred by his local doctor with a diagnosis of possible pneumonia and with the history of having contracted a severe cold two months before from which he had not recovered.

Roentgenograms showed definite evidence of metastatic growth in both lung bases, and he died two weeks later after a severe fit of coughing, accompanied by dyspnea and the expectoration of 10 ounces of blood.

CONCLUSION

It is very evident from our experience that continual irritation or moderate force has a tendency toward the development, or at least activation, of the growth of bone tumors, but there is little, if any, evidence from which we can conclusively assume that such tumors are developed through one act of trauma in which the force is moderate or severe.

DIVERTICULOSIS OF THE VERMIFORM APPENDIX*

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APPENDICIAL diverticula are more frequent than is generally recognized. The frequency of occurrence as reported by different authors is as follows:

	Per Cent
Moschowitz	0.28
MacCarty and McGrath	0.34
Stout	1.90
Chase	0.76
Pack and Scharnagel	0.74

This statistical data is based on the number of appendices removed by surgical operation, and therefore is not a true criterion of the percentage of occurrence in the great unoperated majority, because it is quite probable that the diverticula may predispose to, or even be the result of, inflammatory conditions in the appendix, resulting in its removal. Necropsy and dissecting room findings indicate that diverticulation of the appendix is comparatively less frequent than among surgically removed specimens.

The age incidence varies from adolescence to senility. Wilkie observed diverticula following carcinoma of the appendix with obstruction in a girl fifteen years old, while one case of MacCarty and McGrath's occurred in a patient sixty-four years of age. The progressive increase in obliterative changes of the appendicial lumen with advancing years accounts for the concurrent diminution in the frequency of diverticulation. The sexes seem to be equally affected.

According to Chase, diverticula of the intestinal tract are either true or false, depending respectively on the presence or partial absence in the sac of the characteristic tissue layers of the intestinal wall. A false diverticulum may be defined as a protrusion or evagination of variable layers of the inner coats of the intestine through preformed, congenitally potential, or acquired apertures in the muscular layer. The wall of such a diverticulum consists of mucosa with a somewhat variable muscularis mucosae and submucosa and is covered externally by the serous layer of the intestine. All diverticula of the appendix are of the false or mucous membrane type.

Opinions vary as to whether diverticula of the appendix are congenital or acquired. Krabbel champions the latter hypothesis, whereas Schmincke reports two cases of possible congenital origin. As has been previously mentioned, congenital mural defects may predispose to the later development of these saclike herniations. Such a defect may exist around the blood vessel walls as they perforate the muscular coats of the appendix. When these vessel openings become enlarged they account for an increased potential weakness at these particular areas. It has been suggested that a congenitally weak muscular coat may stretch and finally undergo diastasis due to traction from without or pressure from within the lumen. Increased tension within the lumen followed by diverticulation has been attributed to chronic constipation with intra-appendicial fecal distention. Stout conducted a series of experiments on dogs and from his conclusions accepted the hypothesis of muscular contraction as the most probable force causing these outpouchings in the wall of the appendix.

The acquired type is more commonly the immediate result of an acute exudative

* From the Department of Pathology, School of Medicine, University of Alabama.

inflammation of the appendix which is accompanied by mucosal ulcerations or intramural abscesses. The scar tissue which

Fig. 1. Multiple diverticula of the vermiform appendix.

replaces these localized lesions is weak and inelastic and may permit distention and protrusion of the mucous membrane.

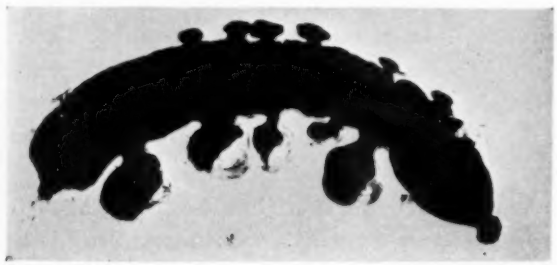

Fig. 2. Roentgenogram of diverticulated appendix injected with barium sulphate.

There are three distinct dangers accompanying diverticula of the appendix: (1) their frequent situation between the leaves of the mesentery lessens their ready detection and leads occasionally to the inadvertent incision of these sacs during appendectomy, resulting in a contamination of the operative area; (2) their presence predisposes to recurrent subacute appendicitis, as has been shown by Chase; (3) their presence increases the possibility of perforations.

The specimens which we considered of possible congenital origin were usually single and situated along the mesenteric border between the leaves of the mesenteriolum. The rational explanation of this

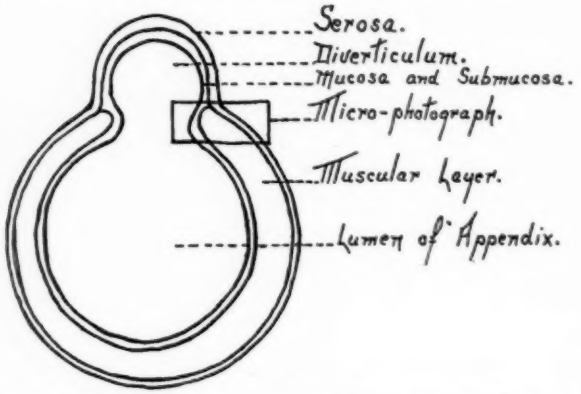

Fig. 3. Schematic diagram of coats of appendix and diverticulum.

localization is that it corresponds to the blood supply of the appendix and is found where the small vascular branches perforate the muscularis. The largest diverticulum of this nature measured 4.5 mm. in diameter.

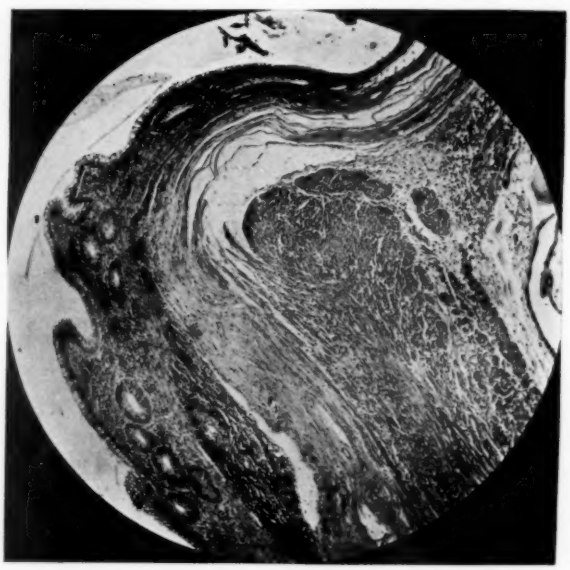

Fig. 4. Photomicrograph of junction of appendix and diverticulum (sac mouth), showing termination of muscle layers at neck of the sac.

The diverticula of the acquired type, so closely associated with exudative inflammation of the appendix, are usually multiple and are located not only along the

mesenteric attachment but on the antimesenteric border and tip of the appendix, rarely elsewhere. The appendix illustrated herein has been the seat of several previous inflammatory sieges. There are an even three dozen (36) diverticula on this one appendix, ranging in size from one millimeter to one centimeter in diameter. Even the very tiny sacs, pin-head in size, have lumen contiguity with the appendix proper. The largest of the 36 diverticula is similarly lined with mucous membrane. Stout declares that all appendicial diverticula larger than this (1 cm. diameter) are lacking a mucous membrane lining.

As in all false diverticula, there is an abrupt termination of the inner circular and outer longitudinal muscle layers at the neck of each sac, so that these muscle coats are not continued over the mucous membrane herniations. These relations are clearly demonstrated in the accompanying photomicrograph.

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MEDICAL ASPECTS OF CHRONIC APPENDICITIS*

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WHEN operation for acute appendicitis was first recommended and the spectacular cures of a hitherto nearly unknown and fatal disease lent a peculiar glamour to surgery in general, appendectomy began to take its place as one of the most common operations in the realm of surgery. Following the brilliant results of this operation in acute appendicitis, it began to be preformed in the interval in patients with recurring attacks of acute appendicitis, so-called relapsing appendicitis. And then it was discovered that many persons with chronic digestive disorders had diseased appendices, and that some were relieved by appendectomy. The result was that the slogan "chronic indigestion with tenderness at McBurney's point indicates a chronic appendicitis" was adopted, and there followed a perfect orgy of appendectomies. Appendectomy being a comparatively simple procedure and the financial reward for performing this operation being considerable, it gradually became the custom for even inexperienced operators to enter the abdomen in suspected cases, removing the appendix whether it showed evidences of disease or not, and either failing to recognize or entirely ignoring other and more important pathologic processes. The result of all this misdirected enthusiasm has been that the ever augmented army of thousands of individuals with chronic abdominal symptoms who have not been benefited by appendectomy have been spreading propaganda against operations in general. It is becoming increasingly difficult to persuade patients to submit to an operation even for acute appendicitis, where all should agree that operation is necessary at the earliest possible moment.

A study of our records has shown that in a series of 1814 patients admitted to the Gastrointestinal Clinic at the Long Island College Hospital, 181, or 10 per cent, had previously had their appendices removed. In my private practice the percentage was even higher, 230 of a series of 1730, or 13.2 per cent, having had a previous appendectomy. In the group of 230 private patients operations had been performed for chronic appendicitis in 173, for acute appendicitis in 17, and as a part of other operative procedures in 40, showing but a lamentably small percentage in which the operation was justifiable in spite of the poor results obtained. The diagnoses made at the time of my seeing the 230 private patients whose appendices had been removed are shown in the table. Females predominated in the series, 158 patients, or over 68 per cent being women.

TABLE 1

DIAGNOSIS IN PATIENTS WITH PREVIOUS APPENDECTOMIES

	No.	Per Cent
Gastroduodenal ulcer	83	36
Gastritis, duodenitis	61	26
Gall-bladder disease	82	35
Colitis	49	21
Pancreatitis	1	0.4
Adhesions	58	25
Hernia	16	7
Hemorrhoids	17	7.5
Carcinoma	7	3
Food allergy	16	7
Total	230	

Taking into consideration the facts presented above, it becomes necessary to discover the reason for the poor results obtained after so large a number of operations, and if possible to suggest some

* Read before The American Gastro-Enterological Association, Washington, April 30, 1928.

remedy. With this purpose in mind, let us first consider a few fundamental facts about the appendix.

ANATOMY AND PHYSIOLOGY

Whereas formerly much was written about the appendix, medical literature in recent years has apparently purposely avoided mention of a little organ, the treatment of which has been so unsuccessful. While some have claimed that it is merely a useless vestigial structure, others have pointed out that an organ so rich in lymphoid tissue that it has been termed the "abdominal tonsil" must have some function. It has been suggested that its secretion may have a regulatory or lubricating effect on colonic motility, yet the removal of the appendix has usually had no bad effects on colonic function, unless postoperative adhesions have caused mechanical obstruction or irritation.

Several anatomical facts in regard to the appendix must be borne in mind to understand its physiological and pathological behavior. In the normal appendix, the mucosa is ciliated, with the action of the cilia directed towards its outlet; its muscular coat is fashioned for contraction in the same direction, and the valve of Gerlach at its outlet acts to prevent regurgitation of cecal contents into the appendix. It is therefore evident that the appendix is supposed to empty itself of its contents, but is not supposed to be invaded by the contents of the cecum. It also seems reasonable to suppose that contractions of the cecum, induced by the entrance of material from the ileum, play a part in stimulating the appendicular contractions.

Being but a small organ, with a very narrow lumen, the thickening of its wall caused by inflammation will cause early interference with function. The early effects of this thickening and stiffening will be the failure of the valve of Gerlach to act, the interference with or even the entire failure of its muscular contractions and the stiffening or destruction of its cilia. The result will be the entrance of cecal contents and their stagnation and desiccation in the appendix, with occasional efforts on the part of the muscle wall to expel the irritating mass. These contractions are probably the cause of so-called appendicular colic. The accompanying typhlitis (and it is difficult to conceive of appendicitis without typhlitis) with its effect on colonic and ileocecal function, and later the deforming effects of adhesions, have the effect of raising the gradients in this region, with resulting retrostaltic waves and sphincter spasms causing the familiar symptoms of fullness, heartburn, belching, regurgitation, vomiting and occasional epigastric or general pains or even dysphagia, and increased peristaltic contractions or spasms below, with constipation, cramps or diarrhea. All of these symptoms are usually accompanied by a loss of appetite, resulting in a smaller and less frequent intake of food, with consequently less frequent stimulation to cecal and appendicular contractions, resulting in increasing stasis and desiccation of contents in this region, the whole sequence of events constituting a vicious circle tending to increase the local pathology.

In addition to the local pathology in the region of the appendix it has gradually come to be recognized that chronic appendicitis is only a part of a generalized chronic infection of the whole gastrointestinal tube and its appendages, the principal manifestations of which are recognized in the parts of the tract which show the greatest activity or which have a small lumen or narrow outlet. Thus chronic infections of the stomach and duodenum, (ulcer, gastroduodenitis), liver, biliary tract, pancreas and colon can be almost invariably demonstrated to be present in chronic appendicitis, although their severity may vary. I believe that the "appendicitis nigra" of Dieulafoy, associated with duodenal hemorrhages, is only an example of this accompanying duodenitis or duodenal ulceration. In my private series of 586 patients with a diagnosis of chronic appendicitis, in but 30, or 5 per cent, was

that condition shown to be the only demonstrable gastrointestinal lesion.

ETIOLOGY

The older theories in regard to the etiology of chronic appendicitis, that is, infection by contiguity, by continuity and through blood and lymph supply, are still pretty generally accepted. It had long been recognized that acute appendicitis frequently followed an acute upper respiratory infection, especially acute tonsillitis, when Rosenow first showed a similar relationship between chronic foci of infection and chronic gastrointestinal infections. In going over a large series of cases in which chronic appendicitis constituted a definite part of the gastrointestinal diagnosis, it is particularly striking to note that tonsil infection was almost invariably one of the infective foci found, and occasionally, though rarely, the only one. Dental foci were almost as common as infected tonsils in our series, female pelvic foci being surprisingly uncommon. It has also been my observation that the chronic appendicitis cases in which removal of infective foci in various parts of the body has had no appreciable influence on the symptoms and signs of the appendiceal disease, have been the ones in which the tonsils had not been considered infected and had been allowed to remain. In my experience, removal of infected tonsils causes a rapid subsidence of symptoms referable to the appendix, although shortly after removal there may at times be some acute symptoms and later, deformities, as a result of adhesions or cicatricial contraction, may occasionally cause annoying chronic symptoms.

DIAGNOSIS

While the diagnosis of acute appendicitis rarely presents any great difficulties, the diagnosis of chronic appendicitis has never been as clearly defined nor as generally accepted. The symptoms, both local and reflex, are not characteristic. Pain in the region of the appendix and often radiating upward to the hypochondrium or epigastrium, downward to groin or thigh and backward into the lumbar or sacral regions, may be due to appendicitis or to a number of other conditions. And in a large proportion of cases there are either no localizing symptoms or they are so masked by symptoms of the other coexisting gastrointestinal infections that their diagnostic value is practically nil.

The so-called reflex or retrostaltic symptoms, due to the fact that the irritation in the region of the appendix, by raising the gradients in this region, causes retrostaltic waves with resultant spasms at the sphincters in the ileocecal and pyloric regions and even at the cardia, and mild reverse peristalsis backward to the stomach and even into the esophagus and up to the mouth, are also not characteristic. Similar spasms and similar epigastric fullness, heartburn, belching, sour regurgitation and vomiting may be caused by other gastrointestinal lesions and even by extragastrointestinal irritation. The raising of the gradients also often causes increased peristalsis and spasticity below the point of irritation at the appendix, with resulting diarrhea or constipation, the history of which also does not aid in the diagnosis.

Physical examination in chronic appendicitis is another very uncertain factor in diagnosis. The very multiplicity of "diagnostic signs" and tender spots—McBurney's, Morris's, Aaron's, etc.—shows the relative unreliability of each. Rectal examination shows nothing characteristic. Practically all of the much-described signs may be present in other pathologic conditions in the right lower quadrant—pelvic, renal, muscular and arthritic. I have often felt that the discovery of infected tonsils in a patient with chronic gastrointestinal symptoms is better evidence of the presence of a diseased appendix than any other physical finding.

The roentgenological diagnosis of a "pathological appendix," a term almost invariably meaning a chronic appendicitis, is by far the most reliable criterion of

this condition. While here again the finding of evidences of peptic ulcer, gallbladder pathology and other lesions is the rule, an application of our knowledge of the physiological behavior of the appendix helps to elucidate the roentgen-ray findings. Realizing that a normal appendix rarely if ever is invaded by the contents of the cecum, the visualization of a barium filled appendix in the course of a barium meal series, may in itself indicate that something is interfering with the function of the appendix. In the case of a barium enema examination, the abnormal rising of intracecal pressure might presumably overcome the action of the valve of Gerlach and the appendiceal muscular and cilial action, but in the barium meal series this would not normally occur. Granting that in some fetal types of appendix barium might normally enter its lumen, a normal muscle wall would certainly cause the appendix to empty itself promptly, so that the usual roentgen-ray criterion of a pathological appendix (a barium residue remaining in the appendix after the cecum and ascending colon have emptied themselves completely) may be considered a very sane and reliable evidence of disease, regardless of the location of the appendix. It is, however, also conceivable that adhesions at the neck of the appendix, obliteration of its lumen or recent acute or subacute inflammation of its mucosa, may prevent filling of a distinctly pathological appendix, and in these cases direct roentgenological evidence of a chronic appendicitis would be lacking. In these cases, as well as in the cases with an appendix residue, the indirect evidences of appendiceal disease are of value. These consist of the finding of abnormalities of the cecum and ileum. A considerable ileal residue twenty-four hours after a barium meal, when not due to a prolonged gastric retention, is indicative of some pathology in the ileocecal region and further study of the ileum at one hour intervals following the barium meal may show that this pathology is a narrowing, dilatation or deformity of the ileum due to kinks or inflammations so frequently associated with appendix adhesions. A low pelvic cecum is also often associated with a chronic appendicitis. A small residue in the cecum after the remainder of the colon has emptied itself of the barium meal may be considered indicative of a thickening or deformity of the cecum, also a frequent accompaniment of chronic appendicitis. By means of the opaque enema, roentgen-ray examination will disclose flattening, constriction, irregularities or fixations of the cecum, also indicative of pathology in this region, which would make it hard to believe that the appendix was not also involved in the process. Due to the fact that in the past a roentgen-ray diagnosis of pathological appendix almost invariably meant that the patient would be subjected to an often unnecessary operation, roentgenologists have come to hesitate about making the diagnosis, and clinicians, about accepting it. However, if we realize that a diagnosis of chronic appendicitis does not necessarily mean that an operation is indicated, we can unhesitatingly accept that diagnosis and yet treat our patients medically with success.

TREATMENT

As has already been shown, operative treatment of chronic appendicitis has fallen into disrepute, and it is today difficult to persuade a good surgeon to enter the abdomen expressly to remove such an appendix. The result has been that patients with a diagnosis of chronic appendicitis have been set adrift by the surgeon, have been neglected by the internist and have frequently fallen into the hands of quacks. The question arises, "Is there a medical treatment for chronic appendicitis?" I believe that with our knowledge of the facts discussed so far in this paper, we can unqualifiedly say, "Yes."

Medical treatment is divided into two kinds, general and local. Remembering

that the chronic appendicitis is usually only a part of a general chronic gastrointestinal infection, it is necessary, coincident with our treatment of the appendix condition, to see that ulcer, gastritis, gall-bladder disease and other gastrointestinal infections are taken care of in a suitable manner. Successful treatment of these coexistent infections will always influence favorably the appendix infection. Realizing the important rôle played by focal infection in the etiology of chronic appendicitis, the thorough search for and removal of all infective foci is imperative. It is not sufficient to tell the patient to consult a dentist or specialists in the various fields in which infection foci may be suspected, but it is absolutely necessary for the physician treating the appendicitis to see that the necessary measures are carried out. All pulpless and badly pyorrheic teeth and retained root fragments must be extracted, infected areas drained and alveolar resorption properly treated. Even suspicious tonsils must be removed, and postnasal, sinus or ear infections must be removed or adequately treated. Infections in the female pelvis, the male or female genitourinary tracts, the rectum or any other part of the body must be thoroughly eradicated.

By local treatment to the appendix we do not of course mean local applications from without. The only conceivable way that the condition of the appendix can be influenced is through keeping the cecum in a normal, active state, as activity in the cecum undoubtedly will cause the appendix to contract, empty itself and improve the tone of its walls. In order to stimulate this activity, it is necessary to see that sufficient material is frequently entering the cecum from the ileum. This means that the diet should consist of sufficient indigestible residue, as a completely digestible and absorbable diet will leave but little material passing through the ileocecal sphincter. Frequent feedings also stimulate activity of the cecum by inaugurating frequent peristaltic waves in the cecum. Meat is taboo, as it has been proved by clinical experience that all chronic gastrointestinal infections seem to be unfavorably influenced by meat and its extractives. In the early stages of treatment of a coexistent peptic ulcer, when a high cellulose diet might be irritating to the ulcerated surface, addition of a couple of teaspoonfuls of agar-agar to three or four of the feedings per day will usually be sufficient to stimulate cecal activity, but where there is no contraindication to a normal rough diet, the following diet is recommended:

Breakfast

Milk, 1 glass
Coarse cereal, with added bran or agar-agar, 4 ounces, with cream and sugar.
Egg, one, soft boiled or poached.
Whole wheat bread and butter.
Fruit, raw, any kind.

Luncheon

Milk, 1 glass.
Egg, 1 soft boiled or poached.
Potatoes, baked or mashed.
Vegetables, green, well-cooked, any kind.
Salad of fresh vegetables or fruits.
Bread and butter.
Fruit, raw or cooked.

Supper

Same as luncheon.
Between meals, and at bedtime, and in night if awake, 1 glass of milk and some crackers, bread or cake.

The caloric value of such a diet can be easily changed as indicated by additions or subtractions of foods with high caloric values, and where much previous irritation of the bowel has existed as a result of the use of irritant laxatives or enemas, one-half ounce of mineral oil may have to be administered nightly for awhile as a lubricant. General hygienic measures are also important.

Surgical treatment of chronic appendicitis, as is now becoming the case in peptic ulcer and chronic biliary tract disease, should be confined to operation for complications or causes of appendicitis not relieved by the course of treatment

described above. Every case of chronic appendicitis should be given a trial of medical treatment before operation is attempted. Persistence of symptoms referable to the appendix may mean that adhesions or cicatricial contractions have produced kinks or angulations in the appendix, ileum or cecum, which interfere with function and cause spasms and pains. Repeated attacks of acute symptoms may be due to such conditions or may be due to acute exacerbations of the appendicitis due to overlooking some infective foci or the occurrence of new ones. Acute attacks should of course be the indication for prompt operative interference, the search for and eradication of infective foci being taken care of thereafter. In a series of 586 patients with chronic appendicitis as a part of their gastrointestinal diagnosis, only 30, or 5 per cent, had appendectomy performed, and in no case did a severe acute infection occur.

In recent years the opinion that a chronically diseased appendix may act as an infective focus, causing secondary infections in other parts of the body, has been advanced as a reason for the removal of such an appendix. While it is difficult to be certain that I am correct, yet I feel that the appendix rarely, if ever, acts as an infective focus. In my series of 586 appendicitis cases, 103, or 17.5 per cent, had coincident symptoms in joints, heart, kidneys, bones, skin, eye, endocrine glands, etc., all of which symptoms improved or cleared up entirely coincident with the removal of infective foci and the dietetic treatment as outlined above.

In cases in which persistent symptoms have made operation seem advisable, it is always well to make another general survey of the patient in order to be sure that no infective foci have been overlooked, and by means of dietetic and hygienic care to get the patient into the best possible general condition, so that the operation will be looked upon as but a minor incident and convalescence be rapid and uneventful. After operation the prompt resumption of the diet should be insisted upon, meat not being allowed for a period of at least two months after operation. The following of such a strict regime will prevent many of the disagreeable after effects of operation.

SUMMARY

1. The diagnosis of chronic appendicitis is based largely on roentgen-ray findings, although history and physical examinations are at times of value in diagnosis.

2. The treatment is essentially medical, consisting of search for and eradication of infective foci and of proper dietetic and hygienic care.

3. Surgical treatment is to be confined to the complications of chronic appendicitis, resulting in deformities of the appendix, cecum and ileum.

4. Preoperative and postoperative care help to prevent disagreeable after-effects.

END-END TO SIDE ANASTOMOSIS

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CHICAGO

IN this modification which I call the end-end to side anastomosis is a combination of the technical principles involved in both the lateral and the end-end methods. When performing an end-end anastomosis there is always the danger of primary stenosis if too much tissue is inverted, or a secondary stenosis of the lumen may result from cicatricial formation. Again, two rows of suture cannot be inserted without sacrificing space, thereby adding the possibility of the contents of the bowel to escape. These bad features are eliminated by this new method. It has the advantage over the lateral anastomosis in that it takes less time to perform the operation. It has distinct advantages when bowels of different calibers are to be anastomosed. It is especially useful when the small and large intestines are to be anastomosed, as in iliocolostomy and iliosigmoidostomy.

TECHNIQUE

The procedure for the ligation of the central and collateral arteries and the method of taking care of the mesentery is the same as in the lateral or end-end anastomosis. Figure 1 illustrates the ligation of the central artery and stitches taken at the mesenteric angle well away from the diseased bowel. These stitches include the muscular coats of the intestine so that when they are tied the angle is obliterated, thereby shutting off the collateral circulation and closing the lymphatic channels. In this manner a bloodless operation can be performed with a minimum danger for spread of infection through the lymphatic glands.

Rubber-jawed forceps are applied about 2 inches away from the line of resection to prevent escape of contents from the healthy

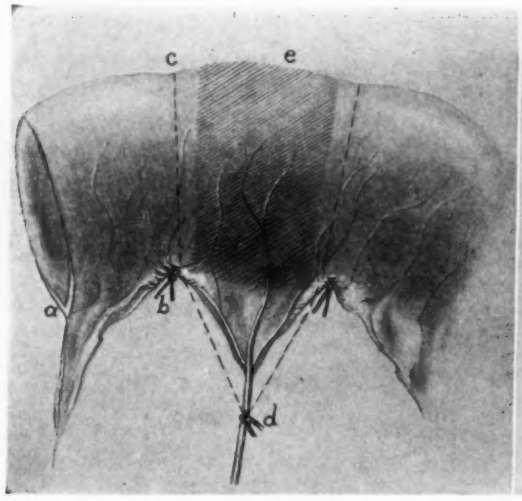

Fig. 1.

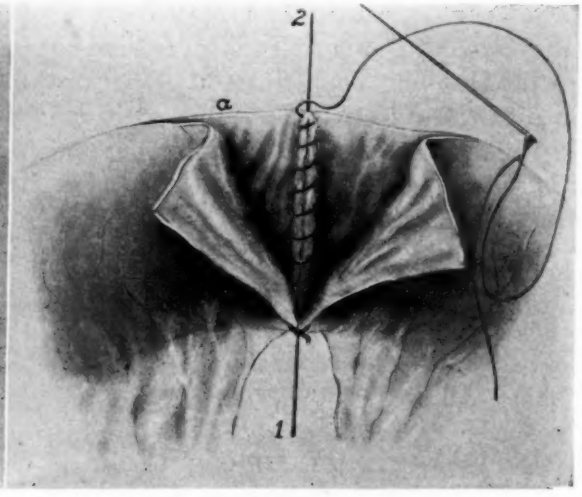

Fig. 2.

Fig. 1. This diagram illustrates essential anatomical points for any section of the small intestine. A. Mesenteric triangle within which are found lymph glands, collateral arteries and nerves. B. Stitch taken at mesenteric angle. This includes muscular coats. It shuts off collateral circulation and lymphatic channels. C. Line of incision with slight obliquity to insure sufficient blood supply to edges. D. Ligation of central artery. E. Pathological area.

Fig. 2. This diagram illustrates the line of incision made upon the anterior border of the bowel after the septum has been sutured.

bowel. Crushing forceps are now applied to control the contents of the diseased intestine. These must be placed so as not to injure the edges of the distal and proximal loops to be anastomosed.

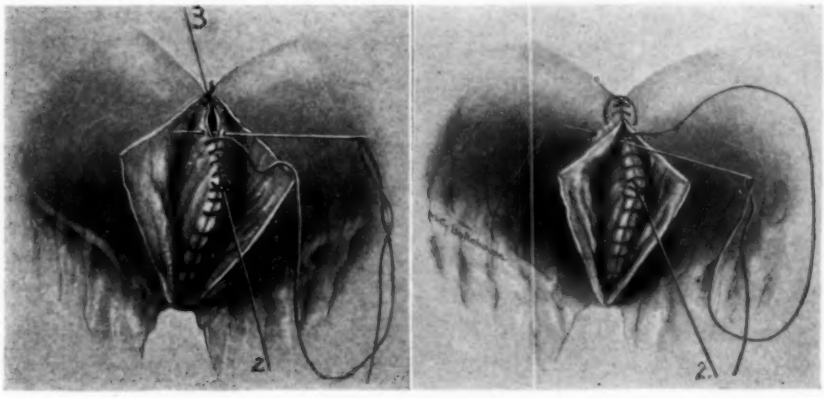

Fig. 3. Fig. 4.

Fig. 3. First traction stitch has been cut The new septum formed is being sutured while assistant holds taut traction stitches 2 and 3.

Fig. 4. Corner has been inverted and anterior edges are turned in by Connell method. Traction stitches can all be cut at this stage.

The bowel is cut with straight scissors just inside the mesenteric stitches so that the latter will be left behind with the healthy loops of bowel to be anastomosed. This incision can be made with a slight oblique angle to insure sufficient blood supply to the edges, especially to that part opposite the mesenteric attachment. The obliquity should always be away from the diseased bowel, otherwise there will be an insufficient blood supply with a possibility of gangrene formation and sloughing.

The edges are now approximated and a traction stitch is placed close to the mesenteric attachments and another at the anterior border (Fig. 2). These are held taut by the assistant so that the septum thus formed can be sutured by a simple over-over and through-through stitch. When this septum is sutured an incision is made along the anterior border of both ends of the bowels. The length of this incision will depend upon the site and location of the pathology. If it is located along the upper part of the jejunum, it can be made equal to the diameter of its lumen, while if it is located at the lower border of the ileum, where the lumen is quite small, the incision can be made twice the size of its diameter. If the pathology is located in between these two extremes, the length of the incision will then depend upon how far or how near the pathology is from the terminal ileum or the duodenal-jejunal flexure. This rule is applicable in cases wherein an extensive resection is done, necessitating anastomosis of bowels with lumen of different calibers. In such condi-

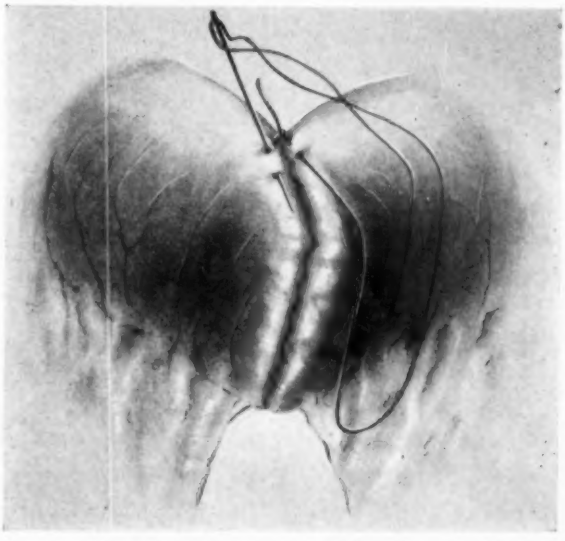

Fig. 5. Connell suture completed and second row of Cushing stiches inserted. This diagram also shows slight angularity that results when anastomosis is completed.

tions a longer incision should be made upon the bowel that has the smaller lumen so that the circumference of the two edges are equalized.

After the desired length of incision is made, another traction stitch is taken at a point where the two ends meet. The first traction stitch can now be cut. The assistant holds taut traction stitches 2 and 3 while the new septum thus formed is sutured with the same over and over suture (Fig. 3). With this same suture the corner is turned in. The anterior edges are inverted by any of the standard methods, preferably by the Connell stitch (Fig. 4).

A second outer row of continuous Cushing stitches is inserted to reinforce the inner row without any danger of turning too much tissue (Fig. 5).

When the operation is completed the lumen will be equal to the original normal opening of the bowel. The anastomosis is a true end-end to side anastomosis which will have a slight angulation. It is more physiological than the lateral anastomosis and there is no danger of stenosis or leakage.

ELECTROCOAGULATION AND DESICCATION IN PROCTOLOGY

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To keep abreast of the valuable and remarkable achievements made in medicine and surgery during the past five years, the electrical scientists and physiotherapists have devised new, and resurrected old, modalities with great success in some fields and rather disappointing or indifferent results in others.

I feel that this is especially true with the resurrection of the old electrical modalities under new names and usage, namely, the d'Arsonval and Oudin currents, now known as the current for electrocoagulation and electrodesiccation respectively. The term "endothermy" has also been coined in their usage, to which I believe a great number of the electrotherapeutists object.

Hand in hand with every scientific achievement, particularly when there is a piece of apparatus involved, commercialism appears. This is a natural course of events and is sponsored, stimulated and promoted by those manufacturing the special apparatus. Sometimes the enthusiasm runs high and is carried beyond the point of expectation to one of alarm, especially when the apparatus in question may be destructive rather than beneficial.

It is a conceded fact that the average physician both young and old is very enthusiastic and gullible not only in wildcat stocks and bonds but also in new implements for the relief of human ills. With the pressure that was brought to bear by the manufacturers, the literature sent out by them and the articles appearing like mushrooms over night in various journals and pamphlets lauding the utilization of the different modalities for the relief of pain, the removal of growths, tonsils and hemorrhoids, there is little wonder that every physician who could afford it became interested and equipped himself with this panacea for curing all ills.

I have no axe to grind nor am I criticizing the work or report of any individual or group of individuals but rather a method which, due to its laudation, led me to believe that at last a panacea had been found for all protological ailments especially hemorrhoids. But the glowing reports of the simplicity with which electrosurgery could be used in this field and the splendid results obtained I found far from satisfactory both by inquiry and experience.

As I am interested only in the utilization of these modalities as they appertain to proctology, I shall avoid the various fields in which they may be employed.

A very brief explanation of the d'Arsonval or bipolar current and the Oudin or monopolar current will not be amiss, as frequent reference will be made to them. As I stated above neither of these modalities are new to the electrotherapeutist, but of late have been used in the destruction of tissue, both neoplastic and benign, with surprising results in some cases.

The Oudin or monopolar current is that current which is obtained from a well-balanced diathermy machine through a single lead, and is probably better known and recognized as the terminal used for fulguration. There is no definite formula or meter reading in using the Oudin current, and one must learn from experience with his own machine just how much spark is needed to obtain the desired amount of desiccation. The best spark control in my estimation is that designed by Dr. Kollischer. Even with this knowledge at hand I have found it variable, depending upon several conditions, namely: how long the machine had been running prior to operat-

ing with it, the size of the patient, whether he was grounded or not, and atmospheric conditions.

This current is used for electrodesiccation. It has a high voltage, 15,000 or 35,000 volts, while the amperage is low (not exceeding two hundred milliamperes). The oscillations range about 1,250,000 per second and are damped. The high voltage and low amperage and the number and character of the oscillations used here cause a superficial destruction to which the term electrodesiccation has been applied. This has been ably described by Dr. William L. Clark as follows: "A dehydration of the cells occurs and a subsequent mummification and pulverization with death of the tissue resulting." In other words, we obtain an electrical destruction with sloughing.

The d'Arsonval or bipolar current produces electrocoagulation, an actual dissolution of the tissue which causes them to become transformed into a homogeneous mass, a complete disintegration of all the tissue with which it comes in contact. It is used by applying an indifferent electrode to some portion of the body (in hemorrhoid work, usually under the buttock) in the form of a flat piece of block tin which is connected to one pole of the apparatus; the other pole or lead is connected to the needle holder. A meter is used for the determination of the amount of current employed.

This current differs from the monopolar in that it is of low voltage, the maxim being 15,000 volts of high amperage, ranging from 1,500 to 6,000 milliamperes.

There are two methods advocated in the destruction of hemorrhoids. One employs 1,500 to 2,000 by the flash method. This is an instantaneous turning on and shutting off of the current, generating very little heat in the tissue. The other is using 350 to 500 milliamperes and keeping the needle in situ until the tissue turns grayish-white. I found this to be the better procedure, except that the patient will sometimes complain of the heat. In either of these methods a foot switch is necessary for the control of the length of application. The amount of amperage is absolutely under control by reading the meter and adjusting the spark gap to the desired amount.

I think this short description comprehensive enough to proceed with the technique and its results.

The technique or procedure in the treatment of hemorrhoids as employed by the several operators is about the same. A local anesthesia of either quinine hydrochlorid four per cent, novocaine and adrenalin, or quinine and urea is used. This is injected into the mucocutaneous margin of the rectum, when there is a single hemorrhoid, or if complete anesthesia is desired in the midline anteriorly and posteriorly, and all the tissue about the rectum infiltrated. After a few moments one may proceed. Either current may be employed. The needle is thrust into the mucosa alongside of the hemorrhoid or into the vein itself, and the current allowed to flow until the tissue blanches a grayish-white. This is usually preceded by a lighting up of the tissue with boiling and bubbling; about twenty to thirty seconds is all that is needed.

In using the bipolar current great care must be exercised in not penetrating too deep, for by so doing the musculature is coagulated and the resulting scar formation may cause a marked contraction of the orifice with very unsatisfactory results. This in substance is the technic as applied to one or more hemorrhoids.

The glowing reports of the early workers were not substantiated by my inquiries and experiences and as the intent of this paper is a criticism of a method which was strenuously advocated to replace all other methods for hemorrhoidal work, a revelation of its shortcomings will not be amiss.

I take issue with the statement that this is a simple and painless office procedure which is a point stressed in every paper written. It is time-consuming and requires special time set aside for its employment, thus interfering with office procedure. Neither is it as simple as the description makes it appear. The setting up of the

apparatus, its testing, the noise of the sparking, all tend to make the patient nervous. In order to overcome this, more time is consumed reassuring him that he will not be injured. (To offset this, I have my motor placed at a remote point so that it cannot be heard.) After gaining the patient's confidence and the anesthesia has been injected, one is ready to start. Again the reassurance that he will not be hurt sets the patient on edge waiting for the stick of the needle. This he usually does not feel, but the moment the current is turned on, he, hearing the sparking and feeling the slight warmth in the rectum, invariably jumps. This is particularly true of women, who are naturally nervous about anything electrical. The moving away unexpectedly sometimes pulls the needle out, resulting in a slight, superficial burn or charring, which adds a bit more to the discomfort to come later. Invariably they ask to rest a moment after this first flash, until they get over the effect of the first shock. Again more time is consumed due to more reassurance that they will not be hurt. This continues until you are finished, and the patient is glad to get off the table and you are usually as happy. Several cases have asked to be allowed to rest a while in my office after the operation, which I naturally allowed.

Much to my disgruntlement and chagrin, in a few cases the effect of the anesthesia wore off and the pain and burning in the rectum was so great they were unable to budge. I assure you they were no advertisement for me when they departed.

I may be criticized as to my technique in these cases; so in refutation let me state that if this after-pain did not occur at my office because of my hurrying them on their way, it did occur shortly after their arrival home.

All who have done this work recognize it and suggest that the patient be given an opium suppository, again substantiating my contention that it is not the simple, painless office procedure they claim it to be. Another point that struck me quite humorously was that after advocating this method as painless and not incapacitating, further on in the same article, I find it suggested that the patient remain in bed for a few days! I found it was impossible for them to do otherwise.

As this method became more extensively used and others witnessed the same results as myself, it was advised to do only one hemorrhoid at a time and have the patient return three or four times until all were treated. Why anyone would go through this more than once only our old friend the circus pioneer can answer.

As to the healing of these electrical wounds, they are much slower than those caused by the actual cautery and not nearly as clean. I have not seen one case entirely healed under three weeks.

Let those who are doing electrosurgery in the rectum admit it or not, the procedure causes a destruction of tissue, resulting in a foul smelling slough, which takes a long time to separate, and is exceedingly tender for several days. There is also a far greater possibility of a contraction of the anal orifice with this method because of the uncertainty to which the destruction extends. I have seen two button-hole ani result from over zealous treatment of this sort. If results like these are possible, it certainly is not the method of choice for an inexperienced operator.

In the last paper I read on this subject the same observations were commented upon and the suggestion made that if quinine and urea were used and only one pile at a time treated, very little discomfort would result. I wonder if the author realized that if the quinine and urea were used alone, the slough would result from the injection and no electrosurgery would be necessary.

Bierman's clamp method is the least destructive of any procedure thus far advocated but it has no advantage over the actual cautery. Whether one crushes with an electrified clamp and cuts away the hemorrhoid or uses an ordinary clamp and cautery makes very little difference in the

result obtained, except that the cautery causes less fright and pain to the patient.

I have had just a few exceptional cases in which I felt that electrosurgery was really an aid. When there was a small area of bleeding which I could not control, I have used the monopolar for desiccation with excellent results. Also I have employed it over the surface of a sluggish ulcer to bring about slough and healing. In one case it was very satisfactory in removing verruca-like projections from the mucous membrane.

Everything considered, I feel that this, like numerous other procedures which spring up over night, will gradually be relegated to the waste receptacle of proctology. There is no question as to the efficacy of these modalities in special fields, but from my own observation I see no good reason for them as a method of choice in proctology, especially as they have been advocated for the treatment of hemorrhoids.

Of late there is a noticeable absence in the medical periodicals of articles dealing with this destructive method except as it applied to malignancy and I feel that a more rational attitude has been established toward them. The hysteria has subsided and with it has come again a rationale in treatment reverting back to the tried and true methods, using the modalities as an adjunct rather than a *cure-all.*

FURTHER OBSERVATIONS ON THE OPERATIVE TREATMENT OF LEGG-PERTHES' DISEASE

ROYAL WHITMAN, M.D.

NEW YORK

IN THE AMERICAN JOURNAL OF SURGERY for February, 1928, I described a case of Legg-Perthes' disease in which the reconstruction operation had been performed to relieve the immediate symptoms and to check the progressive deformity.[1] This report is now supplemented by a second case treated in a similar manner.

CASE REPORT

The patient, a rather pale, corpulent girl, twelve years of age, was first seen at the Hospital for Ruptured and Crippled in December, 1927. According to the history she had been well until six months before that time, when on rising quickly from a chair there was a sharp pain about the left hip, increased by weight bearing.

As the symptoms persisted she was placed in bed and remained there for two months, suffering more or less from discomfort about the hip and thigh, supposed to be caused by "rheumatism." The acute symptoms subsided but the limp persisted and for this reason she was brought to the hospital.

It was noted that the left limb was extended and slightly adducted, that all movements of the joint were restricted and that there was discomfort on forced movement. The roentgenogram showed an epiphysis, irregular in outline and much diminished in depth (Fig. 1). From the history of the sudden onset and subsequent pain it seemed probable that the primary cause of the symptoms was a displacement of the epiphysis, but on opening the joint the head presented the typical appearance of Legg-Perthes' disease, of what Legg calls the cap type. There was no other apparent pathological change except a thickened and congested ligamentum teres.

The distorted head was removed, the extremity of the neck moulded into a smooth rounded extremity and the trochanter transplanted to the shaft in the usual manner, thus restoring as far as possible the former mechanical relations at the joint (Fig. 2).

The novelty of the treatment in these cases is of less interest than the specimens, the examination of which has indicated apparently the true nature of the process. The first specimen has been described in great detail by the late Dr. Zemansky[1] in THE AMERICAN JOURNAL OF SURGERY and the second, although of an earlier type, corresponded to it in all essentials.

In brief the process is a primary necrosis of the epiphysis caused apparently by deficiency in blood supply, followed by secondary absorption of the dead bone, its partial replacement by fibroid tissue, collapse of structure and deformity. The process is slow and regeneration imperfect because of defective nutrition. The articular cartilage retains its vitality accommodating itself to the changed relations, but the epiphyseal cartilage is usually destroyed.

The duration of the primary symptoms, the degree of persistent disability and the more remote secondary changes of the nature of arthritis deformans are dependent upon the extent of the primary necrosis and the character of the regenerative process. Thus what Legg calls the cap type of deformity, in which the cartilage migrates toward the trochanter, as indicated in Figure 1, resembling finally the back of a spoon, would seem to indicate a more extensive primary necrosis than the mushroom or expanded type, in which the ossifying center, although segmented, is

[1] WHITMAN, R. Observations on Legg-Perthes' disease, with particular reference to operative treatment. AM. J. SURG., 4:185, 1928.

[1] ZEMANSKY, A. P. Pathology and pathogenesis of Legg-Calve-Perthes' disease. AM. J. SURG., 4:169, 1928.

not as completely disintegrated, and in which the head of the bone remains relatively symmetrical.

in which it is promptly and accurately replaced and protected for a sufficient time, permanent recovery is the rule.

Fig. 1.

Fig. 2.

Fig. 1. Cap type of Legg-Perthes' disease showing flattening of head and expansion of cartilage toward trochanter. Before operation.

Fig. 2. After operation. Distorted head has been replaced by a rounded extremity and transplantation of trochanter has restored normal mechanical relation of joint. The condition is similar to an arthroplasty in a very favorable subject and fairly normal function seems assured.

It may be noted that this expansion of the head and segmentation of the ossifying center is often observed as a later change after replacement of a congenitally displaced hip and may be ascribed to the same cause, deficient nutrition and possible injury. Indeed, Calot denies the existence of Legg-Perthes' disease, ascribing all these changes to unrecognized congenital subluxations.

It is apparent that there is no anatomical or pathological correspondence between Legg-Perthes' disease and epiphyseal fracture or so-called slipping, as has been suggested. In the latter instance the undistorted head is displaced to a greater or less degree upon the neck, carrying with it the conjugal cartilage. In those cases

Legg-Perthes' disease involves destruction of the substance of the head. The nature of the process seems to support Legg's conclusion from the observation of patients through a period of years that the final result is but little influenced by the character of the immediate treatment, the degree of final disability being determined by the extent of the primary disintegration of substance, the character of the deformity and the secondary changes that this incongruity may induce in the articulation. For this reason the reconstruction operation may be indicated, if warranted by the physical signs, to relieve the immediate symptoms and to insure the patient from future disability.

EPIPHYSEAL COXA VARA

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THE following case serves as the text of this paper:

E. Q., a girl, aged twelve, was admitted to St. Luke's Hospital, August, 1926. Two weeks before, she noticed weakness in the right hip. She began to limp. Soon she could not stand on the leg nor move it. There was no history of trauma. Examination revealed a healthy appearing girl, mentally bright, rather stout although hardly to be classed as fat. She lay comfortably in bed with the right leg everted, shortened and helpless as in fracture of the neck of the femur. Passive motion of the hip was painful. Tenderness was slight. Roentgenograms revealed a separation of the upper femoral epiphysis. The patient was anesthetized, the displacement reduced and the leg put up in adbuction and internal rotation in a plaster spica. The reduction was satisfactory. She remained in the cast ten weeks and after its removal continued to use crutches for a considerable period.

In March, 1927, seven months after the accident the follow-up report was as follows: "The patient walks well. She has no complaints. Motion of the right hip is free. There is not over ½ cm. of shortening."

In August, 1927, one year after admission to hospital, she appeared in the out-patient department stating that for about a month she had been having pain in the opposite (left) hip and had been limping. Examination showed the left hip to be slightly sensitive and motion limited by spasm. In the roentgenogram there was no displacement noted. A week later, after the administration of salicylates, the patient stated that the pain was gone and she walked better.

Two days after this visit she was admitted to the ward as an accident case. The previous evening while carrying her baby sister she had stepped in a puddle of water and slipped down with the left leg under her. She could not rise and had been unable to use the leg since. The findings, including roentgenograms were similar to those of a year before except that it was the left hip which was the site of an acute epiphyseal separation. Notable in both instances was the comfort of the patient while lying in bed and the small amount of tenderness as compared with the ordinary fracture. She was treated as before in a plaster spica.

An examination as to the endocrine status of this girl, kindly made by Dr. Irving H. Pardee, in October, 1927, is as follows: "Head is round, eyes close together. Small features. Teeth regular and well formed. Jaw is not narrowed. Thyroid palpable. Skin shows abundant subcutaneous fat, is smooth (pink and white) type with the normal reaction to stroking. Axillary and pubic hair is beginning. Mammae, earliest sign of developing though definitely retarded for thirteen years. Hands are broad with markedly tapering fingers. There is hyperextension of joints throughout. The glandular type which she presents is not striking but is hypopituitary and probably hypo-ovarian. The latter is conjectural but the retarded development of the menses and the secondary sex characteristics would indicate it."

At the last examination, April, 1928, eight months after the second separation, she was walking and could run without limp and had no complaints. Motion at the right hip seemed approximately normal. The left leg could not be rotated further inward than the midposition and there was about 20° limitation of flexion of the hip.

To summarize this case, we have an adolescent girl presenting evidence of slight hypopituitarism, who has had pain and limp followed by a separation of the upper femoral epiphysis, first on one side and a year later on the other; in one instance without history of injury, in the second with mild trauma.

This girl presents a condition which has been recognized as an entity since 1888 when it was first described as such by Müller[7] from Bruns Clinic, but which on account of an unfortunate confusion of names and relative infrequency probably remains obscure to most medical men outside the domain of orthopedics. We present this condition to you as a disease entity deserving your interest and attention.

As I have indicated there is an unfortunate confusion of names. That which seems to me most sanctioned by use in

type; six out of twenty-four in the series reported by Key,[6] nine out of eighteen in that reported by Balenzweig.[1]

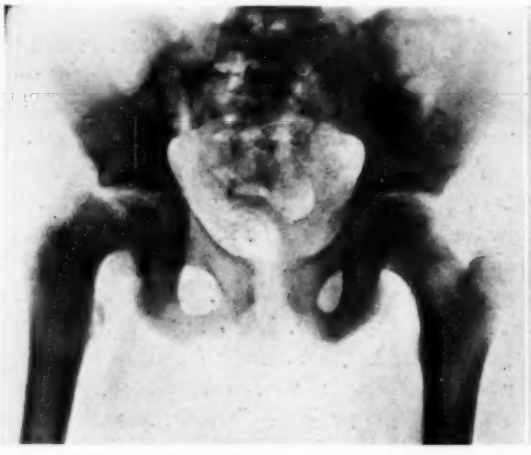

FIG. 1.

FIG. 2.

FIG. 1. E. Q. August, 1926. Separation of right upper femoral epiphysis.
FIG. 2. E. Q. August, 1927. Just before separation which occurred on left side. Note widening of epiphyseal line and fact that upper line of neck is elevated to level of head. On right side separation is well repaired.

American literature is "epiphyseal coxa vara" and I would suggest that it be adhered to. Other names used include adolescent coxa vara, acquired coxa vara, essential coxa vara, slipping epiphysis of the hip, femoral osteochondritis adolescens, and incomplete epiphyseal fracture at the hip.

The term coxa vara, which is a component part of most of the names, is unfortunate as it is merely an anatomical description of an altered relation of the head and neck of the femur to the diaphysis, common to various unrelated conditions. This tends to obscure the conception of the condition as an entity. Epiphyseal coxa vara indicates that the origin of the change is in the epiphyseal region, which is a characteristic feature of the type of coxa vara we are considering. Despite objections it is essential that a particular name shall be associated with this particular disease and epiphyseal coxa vara seems most available.

Epiphyseal coxa vara occurs in adolescents before ossification of the upper femoral epiphyseal line takes place. Ossification at this epiphysis is usually in the fifteenth year, according to Cohn.[3] Boys are more frequently affected than girls. A proportion, varying in different reports, are overgrown or of definite endocrine

The essential lesion is a displacement upward and backward of the femoral neck at the epiphyseal line. It may be a gradual process associated with intermittent pain and limp but not complete disability, or may at any time take on the character of an acute separation, as demonstrated in the case reported. In private and dispensary practice the earlier stages, when the patient is able to get about and even before recognizable displacement has taken place, are the most commonly met and present the greatest challenge to the diagnostic acumen of the physician.

The cause of the slipping is not clearly understood. There are three theories: (1) static, (2) traumatic and (3) pathological softening of the epiphyseal juncture.

The supporters of the static theory point out that mechanically the neck of the femur is at a disadvantage, and the epiphyseal juncture especially, the more its line approaches the vertical. Just before ossification of the epiphysis when growth is the most rapid and strength the least, it yields in some individuals, particularly those subject to severe physical strain, with the development of epiphyseal coxa vara.

Dr. Whitman,[8] one of the most authoritative of the exponents of the traumatic

theory, believes the exciting cause of the displacement to be a superficial fracture at the superior portion of the junction or possibly a less direct injury which weakens the immature bony structure on the diaphyseal side of the cartilage. The unfavorable mechanics of the region predispose to the injury.

Those who hold to the theory of an underlying pathological condition of bone at the epiphyseal juncture maintain that the first two explanations are insufficient in themselves. They point out that a certain proportion of the patients are of abnormal endocrine type. A few among them are inclined to the belief that the condition is due to an attenuated infection located in the juxta-epiphyseal region.

Fromme,[4] who has made an exhaustive study of late rickets and war osteomalacia based on observations of the population about Göttingen during the starvation period in Germany, believes that almost all deformities arising during growth find their basis in a rachitic disease of the skeleton.

Without going into extensive discussion, the conception of abnormal softening of the region of the epiphyseal cartilage from some cause not yet clear, possibly of endocrine origin in certain of the cases, seems to me most in harmony with the known facts as an explanation. Static and traumatic factors may well play a part. I am hesitant to accept a purely static cause, especially in view of the roentgen-ray appearance described below. As for trauma, one is impressed in these cases by its lack in sufficient degree to account for fracture as ordinarily observed. It is true that epiphyseal line fractures are commonly observed in adolescents, but in a study of such injuries I have never obtained an impression that they were more easily produced than other fractures in children.

One factor that speaks for an abnormal condition of the juncture between bone of the neck and cartilaginous plate is the roentgen-ray appearance in which there may be widening of the epiphyseal line with some adjacent bony irregularity. Unfortunately pathological examination of the region throws little light on the subject, although there have been some specimens obtained. According to Key,[6] microscopic examination shows an epiphyseal line broadened and vascular. "The cells have lost their orderly arrangement in columns and are scattered irregularly through the cartilage matrix. The bone and marrow of the head and neck are essentially normal. Islets of cartilage may be in the marrow in the vicinity of the epiphyseal line." Wilson,[9] who reports seven operative repositions, four in recent displacements, describes the gross appearance as rather that of a separation through cartilaginous layers than fracture. Pathological studies of sections removed showed callus.

Fig. 3. E. Q. Sixteen days later than Figure 2. An acute separation has occurred.

Epiphyseal coxa vara is not a common

condition, yet in Key's[6] estimation it is the most frequent cause of hip disability beginning in adolescence. The only case

Fig. 4. E. Q. April, 1928. Twenty months after separation on right and eight months after that of left. Note that anatomically result on right is better; this is true functionally also.

that I have been able to find, other than the one described above, which has been treated in St. Luke's Hospital in recent years was under the care of Dr. Bolling[2] and reported by him. I had occasion to examine this patient at the time of his admission and with Dr. Bolling's permission I include a summary of the case.

The patient, C. W., normal appearing, was a boy of fifteen. Five months before he commenced to have pain in his left hip which caused him to limp. He was treated with massage for two months. No roentgenogram was made. He felt well after this until three weeks before admission when the pain recurred and became progressively worse. He walked until the day before admission. There was no notable trauma. Although brought to the hospital in a car he was able to sit on a bench in the dispensary until examined. The left hip was practically fixed by muscular spasm with the thigh rotated out and adducted. There was shortening of about 2 cm. and some atrophy of thigh and leg. The roentgenogram showed a complete epiphyseal fracture of the hip.

The displacement was reduced under anesthesia by Dr. Bolling and the boy put up in the Whitman position. The cast was worn three months and a caliper two months more. The follow-up report at the end of a year gave his only complaint as lack of complete flexion. Roentgenological examination showed ossification complete in the injured epiphysis. On the other side it was not quite so far advanced.

Key,[6] in his study of the Massachusetts General Hospital's cases, found that the period of time that the average patient had had symptoms before applying for treatment was several months. The symptoms consist of pain in the affected hip, sometimes in the knee, and limp. In those who suffer an acute separation there is complete disability. A history of trauma may or may not be obtained. When present it is apparently not comparable to the degree of damage found.

The local physical findings depend on the acuteness of the condition and the amount of slipping that has taken place. Spasm will limit motion in cases that are at all acute. As the deformity develops the leg assumes a position of outward rotation and adduction with shortening. Flexion and internal rotation are particularly limited. The trochanter rises above Nelaton's line. In the instances of acute separation that I have observed, it has seemed to me that the patients were much more comfortable and had less tenderness than with the ordinary fracture of equal gravity.

The widening of the epiphyseal line and irregularity of adjacent bone as shown by the roentgenogram have already been mentioned. Whitman[8] describes as of diagnostic importance a leveling of the outline of the upper side of the neck and head instead of the head rising above the neck as is usual. This would indicate a slight degree of slipping.

In those patients in whom an acute separation has taken place the differential diagnosis rests between ordinary fracture and epiphyseal coxa vara. The history and age should settle the question. If there is no acute separation, other conditions which come into consideration are tuberculosis, Perthes' disease, various types of cervical coxa vara, and juvenile arthritis deformans. Epiphyseal coxa vara was probably originally usually mistaken for tuberculous coxitis. The roentgenogram, absence of inflammatory swellings or

sinuses, habitus and general condition of the patient would all help in the differentiation. Perthes' disease occurs ordinarily in the earlier years of childhood and shows characteristic changes in the head of the femur.

Cervical coxa vara is a term used to denote the varus position when due to yielding in the neck itself rather than at the epiphyseal line. Rickets may be the underlying cause. Such a type would ordinarily be bilateral. Cervical coxa vara may be a congenital condition. I have seen it as a unilateral finding in osteitis fibrosa. Fracture through the neck may be followed by coxa vara. Juvenile arthritis deformans is a rare condition with which I have had no experience. Presumably the roentgenogram would be important in making the diagnosis.

The prognosis of epiphyseal coxa vara seems rather uncertain. Arthritis may be a sequel. Kappis[5] in a study of late results found that in two cases where there had been a failure to correct the deformity there was disability after eight years. In other cases studied the outcome was functionally excellent but roentgenographically bad.

My own very limited experience would lead me to believe that if an acute separation is adequately treated, the functional result will be good although the late roentgenographic appearance is considerably altered from the normal. Ossification is likely to be hastened in cases that have suffered an acute separation.

If an acute separation has occurred the treatment is the same as that for fracture; manipulation under anesthesia and fixation in abduction and internal rotation. Support of the joint should be continued for five to six months. If the condition is diagnosed before deformity has taken place, protection from weight bearing is indicated. Wilson[9] has reported good results from open operation in seven cases, four of them acute. In the acute cases this would seem to me ordinarily inadvisable as the operative procedure is not without risk. Where satisfactory manipulative reduction cannot be obtained, it would appear to be the method of choice.

CONCLUSION

It has been the purpose of this paper to present epiphyseal coxa vara for your consideration as a well defined entity which has not been as generally understood nor as frequently recognized as its importance merits. While static and traumatic causes probably play a part, its causation is best explained by softening at the junction of the epiphyseal cartilage and neck. The occurrence of endocrine types among a proportion of these patients suggests as an explanation abnormality of bony growth.

In an adolescent, particularly a boy of a stout type, who complains of pain in the hip associated with limp without adequate traumatic basis, this condition should be considered and a roentgenogram made as well as a careful physical examination. If such a patient suffers a sudden complete disability with eversion and shortening of the leg, an acute epiphyseal separation has probably occurred. It should be the hope of physicians to make the diagnosis and institute treatment before deformity or complete separation supervenes.

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NEW ROENTGENOGRAPHIC DEMONSTRATION OF FRACTURED NECK OF THE FEMUR*

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IN the course of considerable experience in roentgenography of bones and joints, numerous studies were made of fractures of the neck of the femur. Usually the neck of the femur was obscured by overlapping shadows of the greater trochanter and of the edge of the acetabulum and, notwithstanding the fact that stereoscopic films were in almost routine use, absolute statements could not be made of the exact position of the fragments and the degree of their bony union.

The observation of the same faulty results in roentgenograms from other sources as well as my own, and the general lack of satisfaction from these examinations, prompted me to attempt a variation in technique to demonstrate the neck of the femur without any overlapping shadows whatsoever. This was accomplished by the very simple expedient of internally rotating the femur and holding the foot inward, immobilizing it in this position during the exposure. It is possible thus to procure roentgenograms which will show the entire neck of the femur without any superimposed shadows. As a result of this simple change in technique I have clearly visualized the neck of the femur in every examination and am able to report the exact position of the fragments and the degree of union.

The accompanying illustrations show the exposures in the classical position and the new position with the leg rotated internally. Caution must be exercised in the rotation of the femur in recent fractures so as not to break up impaction of the fragments, if present. I have not found it necessary to use any but the very slightest of effort in securing the desired position of the leg and retaining it there with sandbags about the foot and knee while making the exposure.

The usual position of the patient who has a fractured neck of the femur is with external rotation of the leg, the foot frequently lying almost flat on its external surface. This position would tend to produce considerable overlapping of the neck of the femur by the lesser trochanter and also produce considerable obliquity of the neck of the femur which produces marked foreshortening of its projection in the film. This is, of course, entirely obviated by the simple expedient of internal rotation during the exposure, revealing an unobstructed view of the entire neck of the bone.

* Read before Orthopedic Section, New York Academy of Medicine, April 20, 1928.

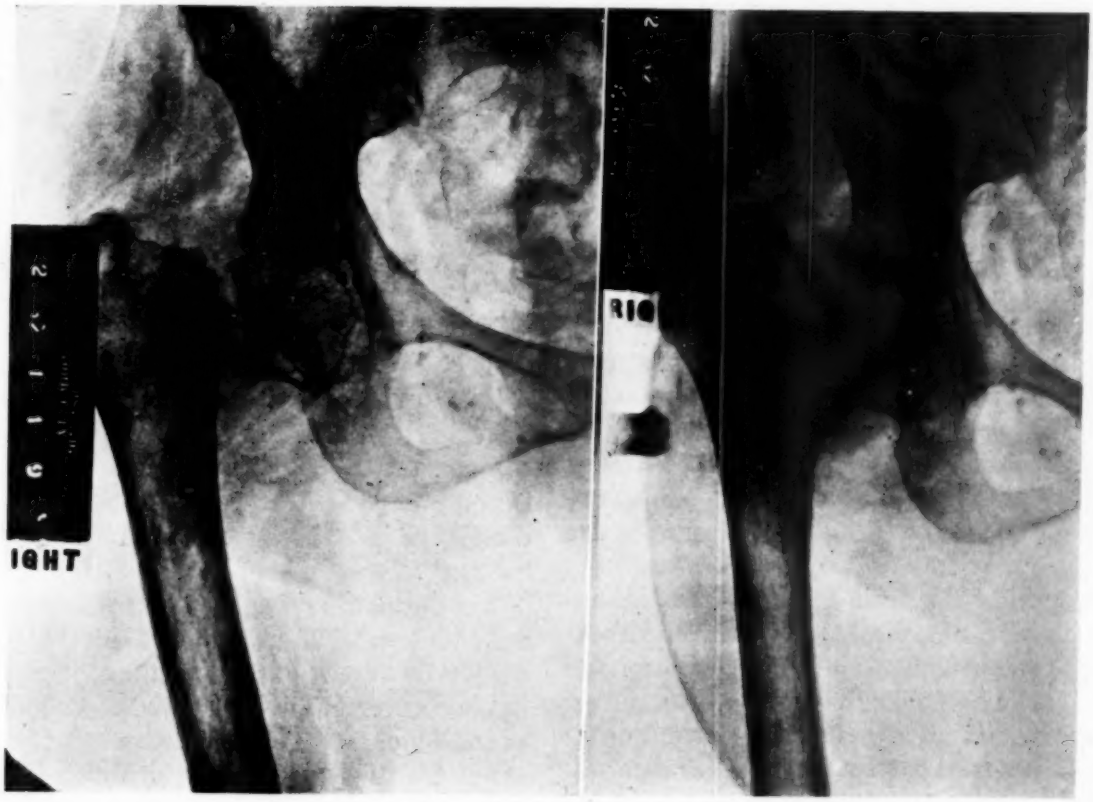

Fig. 1. Routine position.

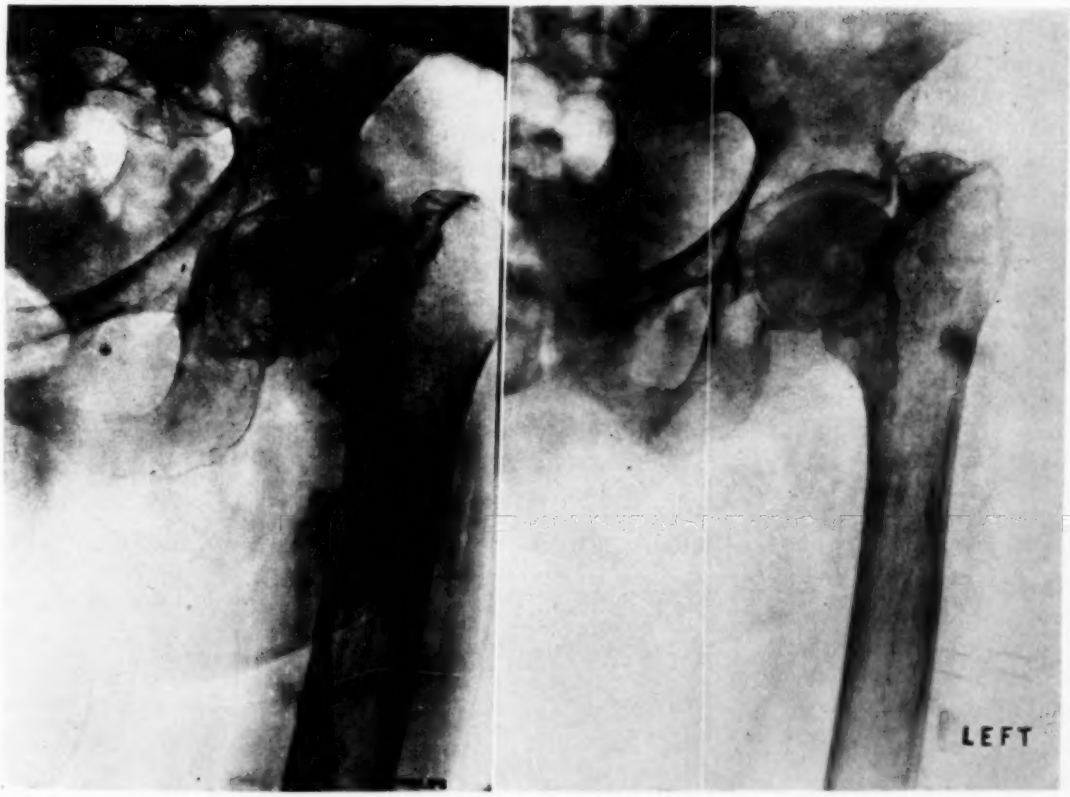

Fig. 2. Special position, with internal rotation of femur.

ANESTHETIC MIXTURE

FOR SHORT OPERATIONS*

HALL G. HOLDER, M.D.

SAN DIEGO

A SAFE and efficient anesthetic is frequently required for short procedures in the hospital, office or home. The mixture to be described has been used in a variety of cases without the slightest ill effect. Performance of painful dressings in the hospital, reduction of fractures, minor surgery or difficult gynecological examinations in the office or home are some of the conditions within its province.

Induction is simple and without discomfort to the patient. Anesthesia is almost instantaneous, lasting from five to ten minutes and relaxation is surprisingly complete. Recovery is a matter of minutes and is unattended by nausea, vomiting or other distressing after effects, so that there is no detention of patients as the result of the anesthetic.

For the physician this method is equally advantageous as it is inexpensive, requires no apparatus or assistant to administer and but for ordinary care regarding inflammability may be administered in any location or under any circumstances. It is therefore particularly suitable for emergency surgery in urban or rural practice.

TECHNIQUE

For convenience four anesthetic doses are prepared at one time. The formula is as follows:

Chloroform	2.0 c.c.
Ether	96.0 c.c.
Ethyl Chloride	22.0 c.c.
Oil of Orange	1.0 c.c.

M. et Ft. Sol.

Keep on ice when not in use.

Thus each adult anesthetic mixture contains 0.5 c.c. chloroform, 24.0 c.c. ether, 5.5 c.c. ethyl chloride and 0.25 c.c. oil of orange, each in themselves innocuous but combined producing a safe and efficient mixture.

For induction one ounce is poured on a sufficiently large portion of cotton and slowly lowered over the nose, the eyes being protected with a towel. The oil of orange masks the disagreeable odor of the other constituents so that patients seldom complain. When accustomed to this initial procedure an ordinary rubber bathing cap is stretched over the chin and forehead, acting as a rebreathing bag. Respiration is stimulated by rebreathing of exhaled carbon dioxide, the mixture being rapidly inspired with resultant instantaneous anesthesia. Anesthesia will last from five to ten minutes, care being taken not to allow patients to become cyanotic. After the bathing cap is removed consciousness is rapidly restored, permitting discharge of patient so far as the anesthetic is concerned.

As related above there are no disagreeable sequellae to the anesthetic. This method has proved very satisfactory in adults and children for a variety of short procedures.

* From the Surgical Clinic of Thos. O. Burger, Clyde J. Osborne and Hall G. Holder, San Diego, California.

CASE REPORTS

VESICAL DIVERTICULUM CONTAINING LARGE NUMBER OF CALCULI ASSOCIATED WITH IMPACTED URETHRAL CALCULI RESULTING IN URINARY EXTRAVASATION INTO SCROTUM*

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WHILE vesical calculi are seen less often than they were before routine roentgen-ray and cystoscopic examinations were made in suspected cases, certain unusual types of these stones warrant a place in the literature. O'Crowley reports a unique case of multiple vesical calculi in which they assumed the form of jack stones. Other writers, including Randall, Rathbun, and Smith, have reported unusual types of bladder stone. The one reported by Randall deserves special mention in that the weight was sixty-four ounces. Venable recently reported a case of stricture of the urethra with multiple calculi in the urethra and scrotum which has many points in common with the one herein reported, in that in each case calculi were found impacted in the urethra and also in the scrotum. He removed sixty-seven calculi in all. Lowsley reported a similar case of vesical diverticulum which contained a large number of small calculi associated with a benign adenoma of the prostate.

Any mechanical factor which results in urinary stasis is conducive to stone formation. This fact is evidenced by the frequency with which stone is seen in the bladder accompanying benign adenoma of the prostate, and also in bladder diverticula. One of us recently reported a case in which we were able to trace the reformation of stone in the bladder from one situated in an adjoining diverticulum.

The unusual feature in this case was the large number of stones which the patient had voided as well as the number that were found in the bladder, diverticulum, and urethra. One hundred and twenty-nine calculi were removed from the bladder and urethra. All the stones were practically the same size, character and composition. They were round, smooth, and phosphatic in origin, and were undoubtedly the result of urinary stasis in the diverticulum accompanied by moderate enlargement of the prostate. The twenty-four stones which were found impacted in the urethra at the penoscrotal junction were found there because the largest stone in the entire group became impacted at this point first. The calculus which was found in the scrotum sloughed through the urethra from pressure necrosis and became separated from the remaining cluster. This was followed by urinary extravasation into the scrotum. Ordinarily one would expect to see more sloughing than was found in this particular case.

CASE REPORT

J. F. H., male, white, aged seventy-seven, was seen on January 25, 1928. Chief complaint was acute retention of urine with pain and tenderness in scrotal region. Past history shows that for the past few years over 140 small round calculi were passed through the urethra at various intervals. Patient has been very active physically and worked as a road builder up until a few weeks ago, performing heavy manual labor.

Present Illness. Since October, 1927, there

*Read before the Medical Society of Virginia, Maryland and District of Columbia, May 16, 1928.

has been some difficulty in starting and stopping the urinary stream, together with dribbling. There has been a marked decrease in the caliber

Fig. 1. Plain roentgenogram showing diverticulum of bladder containing a large number of small round calculi. Soft rubber catheter in bladder.

of the urinary stream and pain has been felt in the suprapubic and perineal regions. This pain became so aggravated that he was unable to

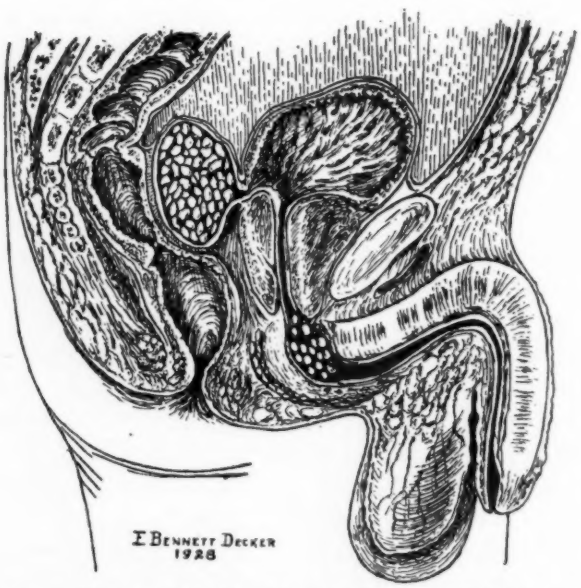

Fig. 2. Sketch of bladder diverticulum containing large number of stones, together with impacted urethral stones and benign hypertrophy of prostate. Extensive extravasation of urine into right scrotum. Bladder markedly trabeculated.

perform his occupation and has been confined to his bed for the past three weeks. Physical examination shows patient to be very old and rather poorly nourished. The head, neck, and chest were negative other than signs of a chronic congestion at the base of both lungs due to the position which he has assumed in the bed. The heart showed marked arrhythmia

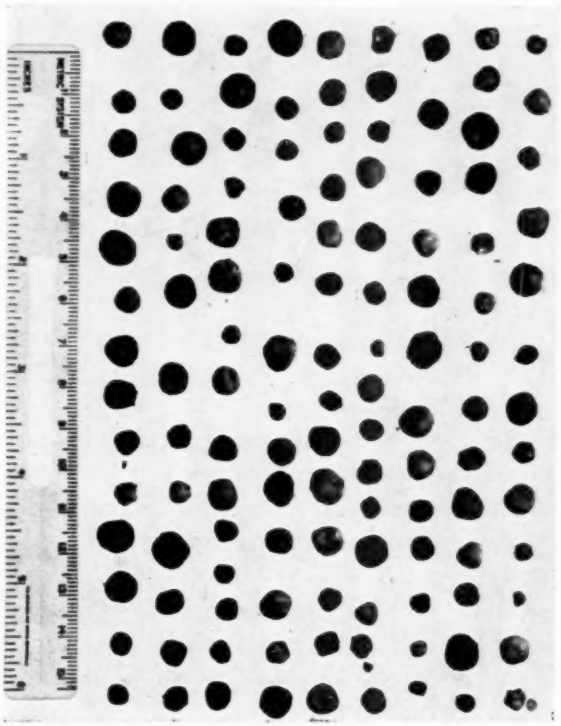

Fig. 3. Photograph showing actual size of stones after removal. Symmetrical, whitish in color, and phosphatic in origin.

with extra systoles and auricular fibrillation. The heart was displaced beyond the nipple line, with the sounds rather faint. The pulse was markedly intermittent with very few normal pulsations coming through. The abdomen revealed a tumor in the suprapubic region extending from the pubis to the umbilicus. On percussion the mass was slightly dull and very painful on pressure. The scrotum was markedly edematous, very tender, and slightly crepitant. The lower extremities were negative. The blood pressure was 140 systolic, 80 diastolic, pulse 60, circulatory index 75. As the patient had not voided in twenty-four hours, an attempt was made to pass a soft catheter to the bladder, but this was unsuccessful. An obstruction was encountered at the penoscrotal junction which was impassible. Stone crepitus was elicited when a steel sound was passed to the site of the obstruction. Following several unsuccessful attempts a soft rubber catheter was finally introduced into the bladder with the aid of a stilette, followed by the withdrawal

of 3000 c.c. of bloody urine. At this time the patient was disoriented as to time, place, and persons. However, this slowly cleared up with the catheter drainage. He was then removed to the hospital and a plain roentgenogram made of the urinary region. This showed a large cluster of stones situated in the bladder area together with a second cluster at the peno-scrotal junction.

On February 5, 1928, the patient was brought to the hospital in extremis as the result of the toxic absorption of pus. The heart sounds were very feeble, the pulse weak, rapid and very irregular. There was a moderate degree of cyanosis as a result of the cardiac failure. Because the patient was such a poor surgical risk, the scrotum was opened under local anesthesia and multiple incisions made therein. One small stone was found in the right tunica vaginalis similar to the ones that had been recovered following urination. The scrotum contained a large amount of bloody fluid with a urinary odor. No evidence of necrosis was seen in the scrotal tissues despite the fact that the extravasation had become very marked. Following this operation the patient's general condition improved rapidly. The pulse picked up in volume and rhythm and the patient was able to ingest large quantities of fluids. On February 9th, a suprapubic cystotomy was done, using novocain locally, and 50 stones were removed from the bladder. The bladder wall was thickened and the mucosa eroded as a result of the irritation from the stones. Some intravesical protrusion of the prostate was noted. A large Pezzar catheter was left in the bladder for drainage.

It was decided not to remove the urethral stones at this time because of the patient's general condition, as it necessitated an external urethrotomy. The adenoma of the prostate precluded the possibility of withdrawing these stones into the bladder at the time of the cystotomy. Following the suprapubic drainage the patient gradually improved, though the pulse was still very irregular and of a very soft quality.

It was thought best to remove the urethral stones before he left the hospital as this would preclude the possibility of a future rupture of the urethra with a recurrence of the urinary extravasation. On February 27th, an external urethrotomy was done under ethylene. Twenty stones were removed from the bulbous urethra. A catheter was passed to the bladder through the normal channel for drainage and the incisions closed in the usual manner with through-and-through rubber tubes in each incision. Convalescence was uninterrupted and the patient was discharged from the hospital two weeks later. Since his discharge from the hospital he has been seen at frequent intervals and is now able to sit up in a chair. The suprapubic and scrotal incisions have healed and his general condition is markedly improved. There is still a marked arrhythmia but the cyanosis and uremia have disappeared.

This case illustrates the manner in which certain of these urinary obstructive cases must be handled; i.e., early diagnosis, surgical drainage, renal decompression, stimulants as necessary, together with a large fluid intake, later followed by removal of the obstruction. Had any radical procedure been taken in this case, there is no question but that the patient would have succumbed. One of the most interesting facts was the lack of necrosis of the scrotal tissues which is so commonly seen in urinary extravasation.

CONCLUSIONS

The points we wish to emphasize in connection with this case are:

1. A routine roentgenogram is imperative before any other measures are instituted in the diagnosis and treatment of pathology of the urinary tract.

2. Vesical calculi occur in from twelve to fifteen per cent of benign adenoma of the prostate and should always be ruled out in preparing a case for prostatectomy.

3. Diverticula are present in from five to six per cent of all prostatic cases and must be recognized before the patient undergoes operation. Such a sac frequently harbors calculi and serves as a nidus for future stone formation if not removed. This happened in a case reported by one of us in a recent series of diverticulum case reports.

This case emphasizes the fact that stasis of urine is one of the principal causes of urinary calculi. This stasis results in the alteration of the urinary colloids and permits precipitation of the urinary crystals,

thus resulting in stone formation. Extravasation of urine demands early diagnosis, radical surgical drainage with through-and-through tube drains. Necrosis of the tissues oftens follows this condition.

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POSTOPERATIVE VOLVULUS OF THE CECUM

H. M. Nelson, M.D.

DETROIT

VOLVULUS of the cecum is an uncommon condition, but volvulus occurring postoperatively must be exceedingly rare because a careful review of the literature recently by Pratt and Fallis* and to a less extent by myself has failed to reveal a single case report. It is for this reason that I am reporting this case.

CASE REPORT

Mrs. M. K. aged twenty-eight, married six years, had one child four years of age, no miscarriages. She was seen originally in January, 1926. At that time she complained of a backache, leucorrhea and dysmenorrhea. The pelvic examination showed her to have a rather marked relaxation of the outlet with a rectocele. The cervix was hypertrophied, deeply lacerated bilaterally and showed considerable erosion. The fundus was fixed in retroposition and there was considerable induration and tenderness in the cul-de-sac. The patient had had an appendectomy seven years previous to her visit here.

With the exception of her being considerably under weight her general examination was negative. There was no history of constipation or of attacks of severe pain which would indicate a partial torsion. Operation was advised at her original visit but she wished to avoid this for a few months. In order to relieve the annoying leucorrhea, the cervix was cauterized.

The patient was seen at intervals until the time of her operation. The cautery treatment of the cervix gave her relief from the discharge but she continued to have a backache and an increasingly severe dysmenorrhea.

The patient was operated June 6, 1927, under ethylene anesthesia. A repair of the cervix, perineoplasty, excision of an adenomyoma, right salpingo-oophorectomy and a modified Baldy-Webster suspension was done. Exploration at the time of this operation showed that the cecum had a mesentery, that it was considerably dilated and that it could readily be brought out of the abdominal wound. The appendix had been removed at a previous operation. The uterus was fixed in retroposition. In the region of the right sacrouterine ligament there was considerable scarring and puckering of the peritoneum with numerous adhesions. On breaking up the adhesions several endometrial transplants were noted. The right tube and ovary were fixed and involved in the endometrosis.

After the tube and ovary were removed an excision of the area containing the adenomyoma was done. This raw area was covered over by bringing the broad ligament behind the uterus and suturing it with fine chromic catgut. On the left the round ligament was brought through the broad ligament and sutured behind the uterus so that a fairly good suspension of the uterus was obtained.

For the first three days the postoperative

* Donald, C. Volvulus of cecum and ascending colon. *Brit. J. Surg.*, 58: 269, 1927.

Pratt and Fallis. Volvulus of cecum and ascending colon. *J. A. M. A.*, 89: 1225, 1927.

course was uneventful. There had been a slight amount of vomiting on the first day but after that the patient began taking fluids. The highest temperature on the first day was 100°F. Pulse was 100. This gradually fell to normal. On the fourth day there was more distention than usual and she vomited frequently. However, the patient looked well and her temperature was normal although her pulse had gone up to 104. Enemas, intravenous salt solution, did not give her any relief. The next day gastric lavage seemed to relieve the distention some. Small amounts of fecal material were obtained with the enemas.

On the seventh, eighth and ninth days her condition remained about the same. The distention persisted, the pulse did not go above 110, and her highest temperature was not over 100°F. She looked so good generally that we felt that conservative treatment should still be tried. There were intervals when the distention seemed to decrease. Her white blood cell count was 7500; polymorphonuclear cells, 68 per cent. Enemas, pituitrin, intravenous hypertonic saline, and gastric lavages were given without much relief, however.

On the tenth postoperative day the temperature and pulse began to rise rapidly, pulse reaching 160 and temperature 101°F. by noon. Her distention became more marked and she became dyspneic, respirations being rapid and shallow. White blood cells, 14,500. It was evident that the patient was in extremis and something had to be done to save her life.

The former midline, suprapubic, abdominal incision was opened. On opening the peritoneal cavity there was considerable blood-stained fluid, which was aspirated. The small intestines were dilated and the pelvis was filled by a large cystic mass. On further exploration this mass was found to be an enormously dilated cecum with one large gangrenous area on the anterior surface. In locating the obstruction we found it to be in the ascending colon caused by a clockwise twisting of the cecum through 360°. The obstruction was immediately relieved by rotating the cecum counter-clockwise. It was noted that the small intestine was almost entirely to the right of the cecum. Owing to the patient's very serious condition, and on account of the gangrenous area of the cecum, a cecostomy was necessary. In order not to delay the operation, the gangrenous portion of the cecum was brought up through the lower end of the midline incision. The abdominal wound was closed quickly by using through and through silkworm sutures. The cecum was sutured to the peritoneum with plain gut. About four hours after this operation the cecum was opened and a tube inserted. It was noted at this time that the cecum had become markedly thinned out and was gangrenous entirely through the wall. Following the release of the volvulus and cecostomy the patient seemed to improve. The distention decreased. However, the next afternoon her respirations became very rapid. Her temperature rose, and she began coughing. Diagnosis was made of bronchial pneumonia. The next day she was much worse. Her temperature rose to 105°F. after a chill. Respirations were 48 at that time. She was transfused twice. Following the chill and high fever her temperature gradually decreased, and about ten days later she returned to normal. Patient's general condition rapidly improved. Her appetite became good, and the cecostomy wound slowly closed in. She left the hospital July 18th, five and a half weeks after her admission. She gained weight and felt very well, but the small opening in the cecum persisted. She returned August 9th. At that time the cecostomy was closed by simply invaginating the cecal wall and bringing the edges together with catgut. It was allowed to remain attached to the anterior abdominal wound wall. The peritoneum was not opened. The patient made a satisfactory recovery from this and to date has had no trouble whatever.

DISCUSSION

This case, like almost all cases of volvulus, was not diagnosed until operation. But here we had to consider all the other possible postoperative complications that might occur and we had no past experience in postoperative volvulus to give us a clue as to the trouble. If we had operated sooner we would not have found a gangrenous cecum and cecostomy would not have been required. I think that the reason for our delay was because the patient seemed so well generally until the tenth day and that at no time did she present a picture of complete intestinal obstruction.

Persistent distention not relieved by any form of treatment is characteristic finding in all the volvulus cases reported. In this case a slight distention, no more than one would expect in a postoperative case, was noticed the

first day. It persisted and increased in spite of all forms of treatment. This, with the normal temperature and pulse until the tenth day when the toxemia became marked, ordinarily should have led to a diagnosis of volvulus.

One might theorize as to the cause of the volvulus. As has been stated, it was noted that the cecum had a mesentery and was considerably dilated. This condition is one of the first prerequisites for the formation of a volvulus. The inciting cause might have been an ordinary postoperative distention of the cecum, the cecum becoming pushed toward the midline and by some sudden movement torsion started. The patient received ethylene anesthesia. The relaxation was not good and it is just possible that some torsion was started at the time of exploring the abdomen or when the intestines were pushed forward with gauze so that the salpingectomy and excision of the adenomyoma could be done.

In most of the cases reported there was a history of recurrent attacks of abdominal pain with fullness and tenderness in the right iliac fossa, nausea and vomiting. Marked chronic constipation was among the chief complaints of most of the patients. This patient gave no history of such attack and was not constipated.

BILIARY FISTULA

Addison H. Bissell, M.D., F.A.C.S.

STAMFORD, CONNECTICUT

ABNORMAL communications between the biliary tract and the viscera, or the outside of the body, are most often due to gallstones. Naunyn[1] collected 384 fistulas due to gallstones. External fistulas were the most numerous, numbering 184. Fistulas into the duodenum were the next most frequent, numbering 108. The external fistulas are certain to attract attention, whereas those into the intestine may be latent but are more often seen in the post-mortem room.

Naunyn reports that 50 per cent of the perforations took place in the right hypochondrium, and 25 per cent near the umbilicus. This is probably due to the guiding influence of the falciform ligament. Recovery took place in 78 per cent of the cases, some with, some without, operation. The fistulas may run a long tortuous course and open in the right iliac fossa,[2] or even in the thigh.[3] Swelling and tenderness in the right hypochondrium had been present in these cases for many months. Cases have been reported as opening into the stomach, various portions of the intestinal canal, the urinary tract, retroperitoneal tissues, thoracic organs and the skin of the abdominal wall.

External fistulas secondary to surgical interference may be mucoid or biliary. In the former probably an obstruction in the cystic duct has been overlooked. The latter depend upon some obstruction remaining in the common duct, due to calculus, stricture, or involvement by pancreatitis. These fistulas, without further treatment, may become permanent and discharge mucus, mucopus or bile.[1] If the obstruction has disappeared they may close spontaneously. As for treatment, operation would seem the method of choice, though many have recovered without.

[1] Naunyn, B. Quoted by Osler.

[2] Pinatelle and Horand. *Lyon Med.*, 107: 383, 1916.

[3] Abell, I. Ruptured gall bladder with unhealed channel of escape opening below Poupart's ligament. *Kentucky M. J.*, 7:219, 1909.

CASE REPORT

Mrs. E. G. A., aged 39, examined May 18, 1925. During the previous night a tender swelling at the upper end of a high right rectus incision had opened spontaneously and drained a considerable amount of pus. This drainage

[1] Mayo-Robinson. Quoted by Osler.

had relieved her of abdominal pain, chills, nausea, and swelling of the right hypochondrium, which had been present for three days. Eleven years before another surgeon had removed 86 gallstones, and drained the gall bladder for ten days. The operation had relieved her, but after three years, and continuing to the present time she has had chronic digestive symptoms suggestive of gall-bladder disease. One year before I saw her she had a severe six weeks illness. She was treated according to her symptoms for "peritonitis." From the time of her recovery to the present illness she has noticed a swelling across her upper right quadrant, sometimes marked, at other times scarcely noticeable. It seems probable that a stone became impacted in the cystic duct with rupture of the gall bladder and formation of an upper right quadrant abscess, which gradually worked its way to the surface along the old drainage tract.

As she flatly refused surgical interference, a drain was inserted. She had daily dressings, and on the eighth night 34 gallstones were discharged, and during the next few days 7 more. She felt well again. In February, 1926, a swelling appeared at the same site which opened and drained. A large stone became impacted in the mouth of the sinus. This she pried loose with a hair pin. Copious drainage resulted, and her symptoms left. During the next few weeks many small stones were discharged, and then the wound healed again. In April, 1927, the story was repeated with intermittent drainage until September, 1927. During this time she passed many stones. In January, 1928, one more stone was passed, then the sinus healed, and there has been no swelling, drainage, or any other symptoms to date. She feels well enough to do all her own housework, including the washing, for a family of six. She has passed in all 150 gallstones.

INVERSION OF TUMOR OF MECKEL'S DIVERTICULUM IN A DOUBLE ILEOCECAL INTUSSUSCEPTION*

H. B. Eisberg, M.D.

NEW YORK

THE production of an intussusception by a tumor of Meckel's diverticulum is not uncommon. The following case, however, presents enough interesting features to justify its report. (1) There was no blood in the stools. (2) The presenting pathology at operation revealed a double intussusception with an inversion of the tumor of Meckel's diverticulum. (3) Resection of 45 cm. of gut with an end-to-end anastomosis was performed with recovery of the case. (4) The tumor was reported as an adenoma containing pancreatic tissue, probably an embryonal rest.

CASE REPORT

V. B., schoolboy, white, aged eleven. Admitted to Community Hospital, March 18, 1928; discharged, March 30, 1928.

Family history: Father forty-two, mother thirty, brother one year, all living and well.

Past history: Occasional pain about navel, and nausea at times; bowels, regular.

Medical: Measles.

Surgical: (1) Tonsillectomy at age of three. (2) Operated on at the age of six for undescended testicle and inguinal hernia on right side. (3) Appendectomy for gangrenous appendix in June, 1927.

Following appendectomy the child improved. However, he occasionally complained of nausea and vague pains about the navel.

Present history: Chief complaint, (1) colicky pains about umbilicus, (2) nausea and vomiting.

Onset: On the evening of March 17th patient ate half the contents of a can of corn. Several hours later he experienced severe colicky pains about the navel, recurring every few minutes. Soon, following this, patient started to vomit, the vomitus consisting of gastric contents from the previous meal. On the day following the onset he had a bowel movement which consisted of mucus and a slight amount of feces.

* Read before Section of Surgery, New York Academy of Medicine, May 4, 1928.

No blood was present. The vomiting and pain continued. At this time a moderately tender mass about the size of a hen's egg was felt

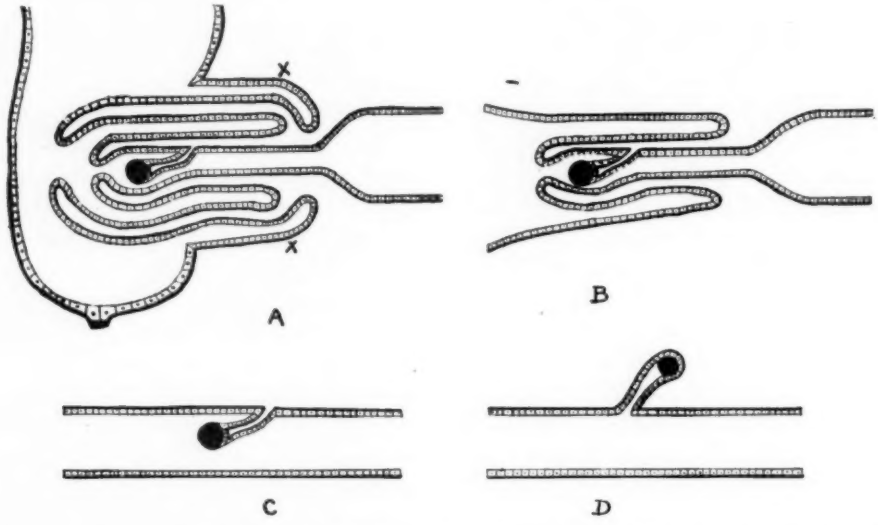

Fig. 1. Diagrammatic representation of pathology found at operation and after various operative manipulations. A, before reduction. B, after primary reduction. C, after secondary reduction. D, specimen after resection and eversion of Meckel's diverticulum with tumor.

occupying the lower right portion of the umbilical region. Frequent enemata returned clear. Patient was then removed to hospital.

Physical examination: General appearance; young white boy, well nourished, appears acutely ill. Examination of eyes reveals a bilateral nystagmus. The rest of the physical examination was negative, except for the abdomen. Operative scars from previous herniotomy and appendectomy noted on inspection. The abdomen was not distended. On palpation a tender mass about the size of a hen's egg was felt in the lower right portion of the umbilical region.

Operation, March 18, 1928. A right paramedian incision was made. Upon opening the abdomen, serosanguineous fluid escaped. A tumor mass was felt which when delivered proved to be an ileocecal intussusception. Slight traction on ileum with contrapressure at cecum reduced the mass in part. The reduced mass revealed a second intussusception which was gangrenous. This was reduced with some difficulty. After reduction a mass was felt within the ileum. At this time it was not recognized as an inverted Meckel's diverticulum. A resection of the gangrenous bowel was performed with an end-to-end anastomosis. Abdomen was closed without drainage (layer closure).

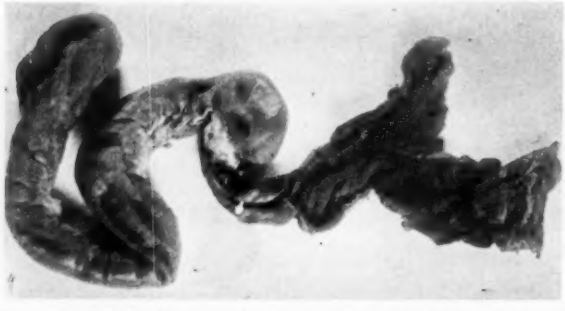

Fig. 2. Photograph of gross pathological specimen showing gangrenous bowel with Meckel's diverticulum open and tumor presenting.

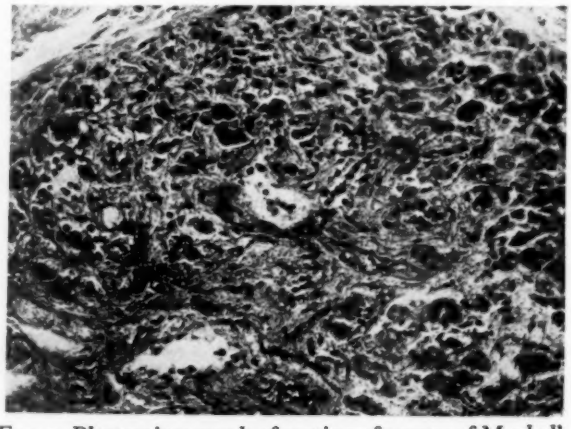

Fig. 3. Photomicrograph of section of tumor of Meckel's diverticulum showing pancreatic tissue.

Pathological report: April 2, 1928. Clinical diagnosis, intestinal obstruction; source of specimen, bowel resection. Gross report: Resected small intestine (ileum) measuring 18 inches in length. Serosa here and there of dark-greenish appearance, otherwise smooth and not glossy. Three inches from proximal end there is a diverticulum measuring 4 cm. in length and apparently consisting of the usual layers of intestinal wall. At the tip of the diverticulum there is a semicircular thickening which surrounds the blind ending of the diverticulum and shows uniform brown tissue on the cut surface.

Microscopical examination: The semicircular thickening of the distal part of the diverticulum consists of well circumscribed lobuli of glandular tissue. The lobuli are separated from each other by connective tissue septa which here and there are slightly edematous. For the most part the lobuli present a tubular structure and only here and there one sees alveoli. The cells are cuboidal or low cylindrical. The nuclei are excentric and situated in the lighter part of the cell body. In only a few places are there solid strands of epithelial polyhedral cells which are separated from the tubular gland tissue by scanty connective tissue. On the whole it resembles pancreatic tissue and is probably a congenital deposit of pancreatic tissue in the wall of the intestine. The pancreatic tissue does not show any pathological changes except for an increase in the interstitial tissue in a few lobules. The pancreatic tissue is imbedded in the edematous muscular coat of the small intestine.

Diagnosis: Pancreatic tissue in Meckel's diverticulum.

Preoperatively the tumor gradually increased in size during the few hours the patient was in the hospital prior to operation. On the first postoperative day the patient had a temperature of 102°F., which gradually returned to normal. He was given a hypodermoclysis of 250 c.c. of a 5 per cent glucose solution every six hours for the first four days. Vomiting was controlled by gastric lavage. This persisted for four days after which fluids were retained. A diarrhea developed on the sixth day which persisted for three days. Sutures were removed on the ninth day. Patient discharged from hospital twelve days after admission.

Sixteen days postoperative the lower angle of the wound showed signs of infection. It was incised and a colon bacillus pus escaped. The wound was dressed daily and healed within eight days. The bowels moved daily after the fourth postoperative day. Patient at the present time is enjoying excellent health.

COMMENT

There was an interval of over thirty-six hours between the onset of symptoms and operation. No blood was present in the stool. This may be accounted for by the fact that the tumor of Meckel's diverticulum blocked the lumen of the canal (Fig. 1, A) with the aid of pressure from the ileocecal valve upon the double intussusception.

The operation for gangrenous appendicitis two years ago did not completely relieve the patient from subsequent attacks of nausea and cramp-like pains in the abdomen. These symptoms might have been produced by the dragging of the tumor (Fig. 1, D). Finally the tumor descended, inverting the diverticulum as it passed into the ileum (Fig. 1, C). Further irritation by the inverted tumor caused an increased peristalsis in an attempt of the bowel to expel this mass. In so doing an intussusception resulted (Fig. 1, B). The reason for the intussusception not remaining primary was that the ileum was anchored 10 cm. from the ileocecal valve (Fig. 1, A, X-X) the result of adhesions from the previous operation for appendicitis. Therefore, instead of the primary intussusception continuing alone through the ileocecal valve, the second was produced and both passed through the ileocecal opening with the inverted tumor of Meckel's diverticulum.

Recovery following resection for gangrenous intussusception is extremely rare, although several cases have been reported. The interesting point in this case is that over thirty-six hours elapsed between the onset of symptoms and operation.

True tumors of Meckel's diverticulum are not common. Comparatively few cases have been reported in the literature. The nearest description to the tumor found in this case was the one described by Albrecht and Arzt and cited in Delafield and Prud-

den's Textbook of Pathology.[1] Microscopically the section showed the structure of the intestinal mucosa, muscularis and tissue resembling the pancreas at the tip.

Dr. S. O. Chlenoff of the Community Hospital, who studied several microscopic sections of the tumor in this case, believes it to be a congenital deposit of pancreatic tissue in Meckel's diverticulum. His detailed description is given under the pathological report. The same opinion was expressed by Dr. A. M. Sala, Pathologist to the Harlem Hospital, who also examined several sections.

PELVIC TUMORS WITH ASSOCIATED UROLOGICAL SYMPTOMS*

George A. Cashman, M.D.

NEW YORK

Case 1. Junk peddler, aged forty, admitted on the medical service, transferred to surgical, treated by orthopedic, later transferred to urological, and finally back to the surgical service. He was admitted with a history of pain in his left hip and leg for nine months, having had treatment at two other hospitals before admission to Bellevue. He had lost some weight. His father died at age of one-hundred three; mother living and well at 70; one brother died of cancer; nine sisters living and well.

Physical examination revealed a poorly developed and nourished adult male. Chest negative. Reflexes normal. No stiffness of the spinal column but there was a lateral curvature probably associated with a "sciatic condition." No pain on stretching the sciatic nerve but considerable pain on extreme flexion and outward rotation of the left leg. Tenderness on pressure over the ascending ramus of the left pubis. Marked fullness of left buttock with obliteration of the depression behind the trochanter and of the left gluteal fold. Left thigh muscles atrophied. Orthopedic consultant considered synovitis of the left hip as the most likely diagnosis and used traction in the line of deformity. Later a plaster spica was applied but without improvement. Urinary frequency, day 3 or 4 times, night 1 or 2 times for several months; dysuria for the past two weeks, more marked past forty-eight hours. Urinalysis: amber; 1027; no albumin, glucose or casts, red or white blood cells. Blood Wassermann negative. Blood count: leucocytes, 7,300; polymorphoneuclears, 77; lymphocytes, 23; erythrocytes, 3,880,000; hemoglobin, 72 per cent. Blood chemistry: N.P.N. 33; Cr. 1.5; Sug. 81. Temperature never above 101°F.

Both loins and external genitalia negative. Prostatic smear negative for the diplococcus of Neisser. Rectal digital examination reveals a uniformly rounded mass in the region of the left prostatic lobe, attached to the pubic wall laterally. Right pelvic cavity free. Upper border of this mass extends higher than the finger can reach. No tenderness. Opinions differed as to fluctuation. The mass has a peculiar soft, rather elastic consistency. Prostatic and periprostatic infection seemed likely at first. A "cold abscess" was also considered. But further roentgenograms and cystograms were made and led to the diagnosis of sarcoma involving the left half of the pelvis with displacement of the bladder to the right. Because of the advanced condition of the tumor surgery was considered inadvisable and deep roentgen-ray therapy employed until the patient left the hospital against advice.

Case 11. Colored male, aged forty, married, no children. No loss of weight; appetite good. His chief complaint was pain of one year duration in the head of the penis after micturition. He was under medical care because of a urethral discharge; frequency 1–2 hour day and night with terminal hematuria and urgency. His doctor is said to have drained a "prostatic abscess" per rectum one week before admission.

Physical examination: Looked chronically

[1] Delafield, F. and Prudden, T. M. Text-Book of Pathology. Ed. 13. N. Y., Wm. Wood & Co., 1925. P. 759.

* Read before Section of Genito-Urinary Surgery, New York Academy of Medicine, May 16, 1928.

ill; reflexes normal; mucopurulent discharge from urethra. Rectal examination revealed very large mass, firm, occupying the position of the prostatic gland; median furrow obliterated, lateral sulci very deep. Mass extends onto both lateral walls. Finger cannot reach over the top of the mass. Greatest induration on the right side, while the upper left portion of the prostate is soft. Opinion was expressed of feeling a bony tumor above the prostate attached to the right pubic bone. On bimanual examination this indurated mass was easily palpated. Metal sound passed gave a definite click. Provisional diagnosis was prostatitis, vesical calculus and neoplasm of bony pelvis.

Urinalysis, cloudy; 1012; alkaline; slight trace of albumen; no glucose, no casts, many red blood cells and some pus cells. Urethral smear showed many pus cells and intracellular gram negative diplococci. Blood chemistry: N.P.N. 37; Cr. 1.6. Blood count: leucocytes 8000; polymorphonuclears, 68; lymphocytes, large and small, 32; erythrocytes 3,900,000; hemoglobin, 65. Blood Wassermann negative. Red test 30/15.

Cystoscopy revealed a greyish rough stone apparently about 4 by 3½ cm. and a fairly large mass which seemed to spring from the right lateral and anterior bladder wall. Its surface is edematous and gives the appearance of a neoplasm, probably a carcinoma. This mass seems to involve the bladder neck and extend backward for a distance of 3 or 4 cm. Roentgenologist reported bony outgrowths from all the pelvic bones, proximal and distal extremities of both femora, proximal extremities of the tibiae, fibulae and humeri. There was bowing of the bones of the forearms and anomolous development of the distal extremities. Irregular calcareous mass in the pelvis just above the symphysis extending more to the right of the median line. Calculus in bladder 2 cm. in diameter. No infiltration or consolidation of either lung. The ribs are normally developed. No pathology found in skull.

Cystogram revealed normal bladder outline with deviation of bladder to the left by osteochronditis of right pubic bone.

Operation was performed in April under spinal anesthesia, a suprapubic cystotomy being done for calculus and biopsy. The peritoneum was found fairly adherent to the pelvic bone and it was dissected back from the bladder with difficulty. Incision about 1 inch long made into the bladder, which was fixed to the pubis and bony mass on the right side. By palpating with the index finger the calculus could be detected in the bladder as well as the somewhat friable mass which seemed to extend into the bladder on the right lateral and anterior walls. A hemispherical, brownish, rough stone and another irregular more or less branching one were removed. In palpating the friable tumor mass several pieces were dislodged. These were removed for pathological examination. There was some profuse bleeding from this area for a short time. It was deemed inadvisable to make a larger opening into the bladder because of the dense adhesions between the bladder and peritoneum. Hence a good view of this mass was not obtained. A drainage tube was placed in the opening. A cigarette drain was inserted into the space of Retzius. The impression gained was that of a bony tumor encroaching upon and involving the right anterior walls of the bladder.

The patient is still in ward doing nicely. The suprapubic wound is closed and he voids all his urine per urethram every 2 or 3 hours. He is gaining weight and strength and is up and about. Receiving deep roentgen-ray therapy.

Pathological report. Macroscopical: Small tags of greyish brown semitranslucent material resembling cartilage; small area of hemorrhage. Histological diagnosis: Chondroma (Dr. Symmers).

SARCOMA OF THE BLADDER
TWO CASES*

C. Travers Stepita, M.D.

NEW YORK

To the cases of primary sarcomata already recorded in the medical literature, we desire to add two cases observed in the New York Post-Graduate Hospital.

Case I. J. E., male, aged four, admitted to hospital May 7, 1917, with history of dysuria for three months, being more marked at night, accompanied by frequency every two hours and with cloudy urine. The pain on urination was accompanied by priapism and the stream was interrupted several times. Temperature on admission was 103.6°F., pulse 96 and respiration 24. Physical examination showed a well nourished, male child, eyes and ears normal. Abdomen showed a palpable mass in the left lower quadrant. Penis, semi-erectile. Rectum, negative as to palpation but pressure to left of prostate elicited pain. Urine examination showed at different times a cloudy or slightly bloody urine with moderate traces of albumin, few white and red blood cells. A provisional diagnosis of calculus was made, but roentgenogram was negative for stones.

Blood count showed 22,000 white blood cells with 76 per cent polymorphonuclears. Cystoscopic examination revealed a markedly trabeculated bladder, with internal bulging of the left lateral wall. The trigone was congested. The right and left ureters were functioning. The urine from the bladder was hazy. There was no evidence of vesical calculus. Diagnosis of a low grade cystitis and papilloma of the bladder was made. One week later a suprapubic cystotomy was done. A large papillomatous mass involving greater portion of the bladder was found. Only a portion of the mass could be removed.

The pathological report: Gross, specimen consists of a number of irregular fragments, frequently hemorrhagic and having a colloid appearance; microscopic, the tissue fragments consist of an irregular mucosa of fibroblastic cells, which are of rather large type and frequently show mitotic dividing forms. The general appearance and character of these cells point to a neoplastic growth. They are, for the most part, spindle shaped, and do not contain much intercellular tissue. The blood vessels are poorly formed, and there are frequent focal hemorrhages.

Diagnosis: Spindle cell sarcoma.

Roentgen-ray treatments were applied with little improvement for about one month after operation. A piece of redundant tissue was snared off from the wound and the pathological report was that of a myxoma, bordering on a spindle cell sarcoma. The growth was very resistant to roentgen-ray treatment, and a large cauliflower mass was soon protruding from the lower edge of the wound. Patient died on September 13, 1917, after being four months in the Hospital. Permission for autopsy was refused.

Case II. J. C. male, colored, aged forty-eight. Admitted to Hospital July 30, 1926, with burning micturition and voiding blood urine and clots for one week before admission, accompanied by nocturia during that period. The patient did not know of any exciting cause. The hematuria at times was quite profuse. Past history: Married, five children, all dead, cause unknown. Had lues twenty-five years previously. Wassermann was negative for the last five years. Physical examination revealed a well nourished, colored man. Head, chest, abdomen negative. Inguinal lymph nodes palpable. External genitalia negative. Urine examination showed at different times moderate amount of protein, red and white cells. Roentgenogram was negative for calculi. Wassermann was negative. Blood count, 10,200 white blood cells, polymorphonuclears, 78 per cent.

Cystoscopic examination showed cauliflower growth, posterior to trigone, about size of half dollar, bleeding profusely. At that time the growth was diathermized. Bladder was intolerant. Some induration rectally. Operation was performed on August 10, 1926, by Dr. McCarthy, suprapubic incision. Bladder was delivered extraperitoneally, opened and tumor

* Read before Section of Genito-Urinary Surgery, New York Academy of Medicine, April 18, 1928.

mass plus about one-half inch of normal bladder wall, surrounding neoplasm, removed. Bladder closed with suprapubic drainage.

Pathological report: Gross, specimen is bladder tissue, measuring 50 × 40 × 30 mm., with a large infiltrating tumor and a very small margin of healthy bladder tissue measuring from 6 to 9 mm. The centre of the tumor is necrotic. On section, the entire bladder wall is infiltrated by a grayish white hemorrhagic tumor, which shows in its central part, a demarcated area 15 × 18 mm. Microscopic, sections from the periphery of the bladder tissue show at the edges transitional epithelium. The stroma beneath is edematous and infiltrated with lymphocytes and a few polynuclear leucocytes with dilated blood vessels. The entire wall is edematous. Approaching the center, the surface becomes denuded of epithelium and the underlying stroma is formed by an arrangement of spindle cells with long spindle shaped nuclei. Between the cells there are numerous fibers. The cells infiltrate the entire wall of the bladder and only a few remnants of smooth, muscular fibers can be found as shown by Van Gieson stain. In the subserous layer of the bladder one can find a blood vessel with a plug composed of cells similar to those infiltrating the wall. The central area of tumor shows considerable necrosis but is composed of the same cells as described. Mitotic figures are quite frequent.

Diagnosis: Spindle cell sarcoma of bladder.

September 27th, 1926, bladder closed. October 3rd, 1926, patient was discharged in good condition.

ABERRANT PANCREATIC TISSUE SIMULATING DUODENAL ULCER*

Henry W. Cave, M.D., F.A.C.S.

NEW YORK

CASE REPORT

History. Patient, sixty-four years of age, housewife by occupation, entered Roosevelt Hospital, October 16th, 1927.

Complaint. Pain in the right upper quadrant of the abdomen.

Personal History. Patient has always been well, with no serious illnesses. Operated upon five years ago for retroversion of the uterus.

Present Illness. Began one year ago with vague feeling of oppression and uneasiness in the right upper quadrant of the abdomen, not constant distress but worse at times, especially after doing her housework. As she describes it, "has a catch in her right side upon occasions with pain radiating upwards toward the left." Meat has increased her symptoms; she has vague aches and pains in her back; she has never had any definite attacks and no jaundice.

Physical Examination. Patient is a well nourished, well developed woman who does not appear to be ill. Sclera clear; heart and lungs normal throughout; the abdomen is negative except for a definite tenderness in the right upper quadrant of the abdomen and particularly in the epigastrium just to the right of the midline; no muscle spasm, no rigidity; no masses could be felt; tenderness is slightly accentuated over the region of the gall-bladder on deep inspiration; urine negative except for a few hyalin casts on one occasion.

Blood chloride, 4.65; urea nitrogen 13.70; creatinine, 1.20; uric acid, 3.06; sugar, .115; blood count, normal.

Roentgenogram Report. Urinary tract: Plain plates made show the kidneys normal in size, shape and position and show no shadows in the region of the kidneys, ureters or bladder that resemble calculus. Gall-bladder: Plates made very faintly visualize a small, contracted gall-bladder with a poor concentraton of dye but without shadows that can be identified as gall stones. Additional plates made after the administration of food show the gall-bladder completely evacuated. Diagnosis: There is apparently a patent cystic duct. The gall-bladder is small and contracted in size with poor concentration of dye. The failure to concentrate may be either functional or due to some inflammatory mucosa changes in the

* Read before Section of Surgery, New York Academy of Medicine, December 2, 1927.

absence of gall-stone shadows. The dye test is suggestive but not positive in its findings.

Preoperative Diagnosis. Chronic cholecystitis.

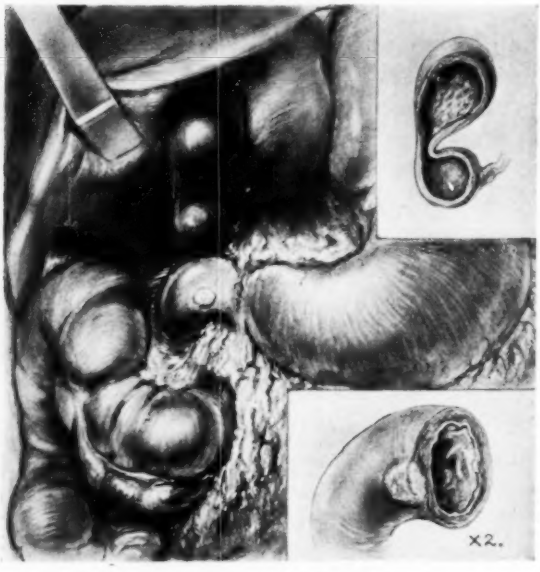

Fig. 1. Aberrant pancreatic tissue.

Operations. Upper right rectus incision was made, October 17, 1927, drawing the rectus outward; the gall-bladder was examined and found to be of grayish color; it did not empty readily. There was a marked kink in the center of the gall-bladder midway between the ampulla and fundus and there seemed to be a tortion of the gall-bladder on the cystic duct. No stones were felt; common bile duct was palpated normal. Distal to the pyloric vein about 1 cm. on the anterior surface of the duodenum there was a small elevated thickened area approximately 1 cm. × 1 cm. It was rounded, the surface roughened; no definite crater could be felt although this thickened area seemed to extend throughout the entire thickness of the anterior wall of the duodenum. It did not have the appearance of a typical ulceration for it seemed to be definitely elevated from the level of the surface of the duodenum. It was excised in the long axis of the duodenum with tan catgut, inverting suture and a continuous whip over suture of linen. A tab of fat was then sutured over this area. The pyloric ring was not affected by this procedure. It was thought advisable to remove the gall-bladder even in the absence of stones on account of the grayish color, the constriction in the middle half of the gall-bladder and the tortion and kinking of the cystic duct. It was removed from above downward; the cystic duct and artery were ligated twice with chromic catgut and the gall-bladder sulcus was sutured with fine plain catgut. The head of the pancreas was palpated normal. There was a definite change in the appearance of the liver, it showing rather markedly whitish lines and bands that ran beneath the peritoneal surface. The wound was sutured by layers in the usual manner with small cigarette drain down to Morrison's pouch.

Pathologist's Report. The slide shows normal mucous membrane and the interlacing bundles of smooth muscle separated in places by masses of epithelial cells. These epithelial cells are arranged in solid masses and in duct-like structures. The cells in the masses seem to be in alveoli and lumina can be demonstrated; the cell masses are supported by a delicate connective tissue stroma and the duct-like structures have a fibrous sheath. The individual cells show a remarkable uniformity in size, shape and staining properties. There are collections of cells which resemble in all particulars islands of Langerhans. No mitotic figures are seen. The tissue resembles pancreas. There seems to be no tissue reaction, unless the fibrous tissue about the ducts may be so considered. Diagnosis: accessory pancreatic tissue in duodenum.

COMMENT

Accessory pancreas is not a frequent surgical finding. Symptomatically it is of meagre significance. Usually accompanying other pathological processes which need to be dealt with, this congenital anomaly is overlooked. The majority of the reports of this condition have come from postmortems. Of three hundred and twenty-one consecutive necropsies at the Mayo Clinic, in which the entire intestine was opened in three hundred and fourteen, Horgan found accessory pancreas in two cases (0.6 per cent). One thousand eight hundred necropsies at the Johns Hopkins Hospital revealed by Opie ten instances of accessory pancreas. Up to the present time about eighty cases have been reported in man.

This abnormality has been found in the stomach, duodenum, jejunum, ileum, folds of the mesentary and even in the walls of the gall-bladder.

There is no uniformly accepted theory as to the cause of accessory pancreas. The most likely explanation is that of Warthin, who states that

"accessory pancreatic tissue is formed from lateral budding of the rudimentary pancreatic ducts as they penetrate the intestinal wall, the mass of pancreatic tissue thus formed being snared off and carried by the longitudinal growth of the intestine either upward or downward."

It is usually in the muscular coat of the intestinal wall that these pancreatic tissue masses are found often separating and distorting the muscle bundles, causing, as some authorities believe, a weakened area through which a diverticulum may form. Not infrequently at the summit of the diverticulum, masses of pancreatic cells have been identified. Whether these diverticuli are the result of traction exerted by the aberrant nodule is a matter of dispute.

However, it seems to me that the most logical explanation is that of a weakened area in the wall and a gradual pushing out, due to increased tension within the lumen of the intestine.

The nodules are usually 1 cm. in diameter, made up of pancreatic acini, ducts and islands of Langerhans. A main duct usually penetrates through the mucosa into the lumen of the intestine and numerous small ducts, minute or dilated and often tortuous transverse the nodule. Inflammatory changes supervene due to invasion of bacteria from the intestine and occlusion of the ducts. Intussusception occurs or bands of adhesions form constricting the neighboring loop of intestine with resulting obstruction; fat increases about an aberrant nodule or even, as cited by Brahan, malignant degeneration may arise from these interesting vestigial remains. Therefore they are of some surgical importance beside being unusual anomalies.

In my own case here presented, there was no symptomatic indication that there existed aberrant pancreatic tissue, except possibly the exaggeration of pain in the epigastrium when meat was eaten. This was the most striking and most constant complaint. The gall-bladder, grayish in color, markedly constricted midway between the fundus and ampulla with a partial twisting of the ampoules and cystic duct, appeared to be a diseased viscus and was removed although no stones were felt within. It is a question which condition produced the distress, the gall-bladder or the accessory pancreas. It seems to me most likely to have been the gall-bladder. Physiologists state, however, that meat causes more rapid secretion of pancreatic juice than either milk or bread; consequently, distension of the pancreatic tissue confined within the wall of the duodenum may have been the source of a certain discomfort.

INTUSSUSCEPTION*

Henry W. Cave, M.D., F.A.C.S.

NEW YORK

CASE REPORT

History. Patient, eleven months old, admitted to Roosevelt Hospital October 13, 1927, with pain in abdomen and vomiting.

Personal History. Normal delivery, no instruments, said to have been a breech presentation not prolonged; no cyanosis; no convulsion; breast fed; no vomiting; no diarrhea; one good movement a day, yellow, soft, no blood, no mucous; no crying; no vomiting after feedings.

Present Illness. Began at three o'clock on the morning of October 13 when a sharp pain in the abdomen caused the baby to be "doubled up in a knot." The second paroxysm of pain caused it to vomit material that looked like milk which had been given to it at 1 A.M., at which time patient had appeared perfectly well and had gone to sleep naturally. Vomiting was non-projectile. One-half hour after attack patient passed a green stool, no blood. When seen by an attending pediatrist of Roosevelt Hospital, patient was found to be in bed apparently suffering great discomfort; it would alternately lie on its side in a doubled-up position or crawl around the bed on its hands and knees.

Physical Examination. Patient was a well nourished, well developed baby of eleven months who appeared to be ill. Heart and

* Read before Section of Surgery, New York Academy of Medicine, December 2, 1927.

lungs were negative; the abdomen was not tense on admission to the hospital and very easily there was felt a definite mass in the right upper quadrant of the abdomen which was somewhat movable. Pressure over this area caused baby to wince with pain. Rectal examination was negative; an enema was given which was returned with bloody fluid.

Preoperative Diagnosis. Intussusception.

Operation. Performed eight hours after onset of attack. A right rectus incision was made and without difficulty the mass was located in the right side of the abdomen and appeared to be a typical intussusception, terminal ileum, appendix and cecum having been drawn well up into the ascending and beginning of the transverse colon. There were numerous large mesenteric lymph nodes at the ileocecal junction, one of which was excised for microscopic study. The reduction of the intussusception was carried out without great difficulty by pushing down on the mass from above and by slight traction on the terminal ileum it was completely reduced. There was an area of thickening in the terminal two inches of the ileum which seemed to be a chronic inflammatory process involving the entire thickness of the last two inches of the ileum. The serosa over this area was congested, markedly edematous. It seemed as though the large bowel was trying to exude through its lumen this diseased portion of the terminal ileum. Appendix appeared to be normal.

Pathological Report. Pathological report of lymph node excised was acute mesenteric lymph adenitis.

Recovery. Patient made an uneventful recovery with rather a sharp immediate reaction, temperature going up to 104.2°F. but dropping to normal on the fourth day; bowels moved satisfactorily first day postoperative and thereafter moved once or twice a day during its stay in the hospital. It was discharged from the hospital October 25, 1927, twelve days after operation.

COMMENT

This case is presented to bring before you a sign of intussusception which is seldom seen in textbooks or elsewhere in the literature. Some years ago I heard John M. T. Finney of Baltimore say that an infant apparently suffering great pain with or without the presence of blood and mucus in the stools, with or without the presence of a mass, but crawling around in the bed on its hands and knees was a diagnostic sign almost pathonomic of intussusception. We have had at Roosevelt Hospital since 1911 twenty-nine cases of intussusception. Seven of these patients have been noticed to be in this characteristic knee-hand crawling position.

SUPPURATIVE ARTHRITIS

Edward J. Donovan, M.D.

NEW YORK

T. D. This is a case of acute suppuration of the shoulder joint in a child four months of age admitted to the service of Drs. Martin and Downes at St. Luke's Hospital, Aug. 9, 1926, with the following history: Pain in the left arm and shoulder for the past two days; fever (two days); discharge from the left ear for two days.

Past history: This child had never been sick before this illness.

Present illness: Two days ago the mother first noticed that the child had a swelling of the left arm and shoulder and cried out with pain when the arm was touched. She also noticed that the child made no attempt to move this arm. He also had fever for the first time two days ago. He was brought to St. Luke's where a myringotomy was done for an acute middle ear infection on the left side. The child was then admitted to the ear service and transferred to the surgical service because of the swollen arm and shoulder.

Physical examination: This showed well developed, well nourished white male child of four months, apparently in acute pain. The examination was negative except that the left ear drained thick pus.

The left arm from the elbow upward over the

* Read before Section of Surgery, New York Academy of Medicine, December 2, 1927.

shoulder joint was swollen, red and tender. All signs most marked over the shoulder joint. There was a spasm of the muscles of the shoulder joint with no effort made to move the arm.

Temperature, 103°F.; white blood cells, 23,000; polymorphonuclear leucocytes 76; lymphocytes 24; urine, negative. Blood culture taken upon admission reported negative.

Roentgenogram of the arm and shoulder joint upon admission showed no evidence of bone infection.

Operation: An incision 2 in. long was made through the deltoid muscle, the fibers of which were split and retracted laterally exposing the capsule of the shoulder joint. The capsule of the joint, which was thickened and edematous, was opened for a distance of ¾ in. About two drams of thick pus were removed from the shoulder joint and a rubber dam drain inserted into the joint. Iodoform gauze was packed about the drain and no attempt made to close the incision further.

Postoperative progress: The arm immobilized at a right angle to the body for five days when the drain was removed and passive motion begun. Shoulder joint moved for five minutes on the fifth and sixth days and then for five minutes every four hours the next three days. Active motion allowed from the tenth day on. Drainage for the first few days was profuse but had practically ceased by the twelfth day. Wound healed promptly, and the child was transferred to the Pediatric Service as a feeding case on the twenty-first postoperative day with the wound nearly healed and complete motion of the shoulder joint.

Follow-up: It is now one and one-half years since operation, and the child has unrestricted motion of the shoulder joint. The left arm is developing normally.

Roentgenograms showed the following development:

1. Upon admission, negative.
2. About two weeks after operation, beginning destruction of the epiphysis of the head of the humerus and the upper portion of the shaft.
3. Six weeks after operation, repair begun.
4. Nine months after operation, regeneration or reossification of the epiphysis of the head. Epiphysis of the greater trochanter.

SHELF OPERATION

TWO CASES*

Armitage Whitman, M.D., F.A.C.S.

NEW YORK

Case 1. R. Z., female, twelve and one-half years old, first came to the hospital August 16th, complaining of limp on the left side. She stated that she had been treated at another institution in 1918 with plaster of Paris spica, but cannot remember that she showed any improvement. The child at that time was in good condition. She walked with a marked limp on the left side with the characteristic gait of congenital dislocation of the hip. The head of the femur could not be felt in the acetabulum, but was situated above it, lying posteriorly on the crest of the ilium. The roentgenogram showed a fairly well formed secondary acetabulum. On this account it was decided to do a shelf operation, feeling that if this was unsuccessful the complete reduction with possible resultant ankylosis might later be performed.

Through a Smith-Peterson incision, the periosteum was stripped down from the outer aspect of the ilium exposing the thickened joint capsule. The head of the bone could be felt lying directly beneath the finger. No attempt was made to explore the original acetabulum. The ilium was split and two fragments turned down so as to cover the head of the femur. These were held in place after being turned down by struts of bone. The muscles were resutured with interrupted chromic gut, the subcutaneous tissue with plain gut and the skin closed with silk. A long plaster of Paris spica was applied.

The patient's convalescence was uneventful.

*Read before Section of Orthopedic Surgery, New York Academy of Medicine, February 17, 1928.

She was allowed out of bed in the fifth week with crutches, but not to bear weight upon the limb. The plaster was removed at the end of six weeks. She had free motion both active and passive in the hip. She was allowed to lie in bed. A roentgenogram taken two months after the operation showed an abundant deposit of bone and fairly firm callous formation over the head of the femur. The patient was able to walk without discomfort and instructed that she might do so as much as she pleased, provided she could do so without pain and without a limp. At that time she stated that the limb felt more solid than before the operation. She was able to bear without pain the entire weight upon the extremity. She was discharged ten weeks after the operation. Since then she has been under observation in the Out-Patient Department. She now walks with a very slight limp which is constantly improving. She has no limitation of motion and no pain. Inasmuch as the patient has a free range of motion and no pain, the result is far preferable to ankylosis of the hip such as might have resulted from an attempt at open reduction and deepening the acetabulum. If untoward symptoms appear later such an operation might be held in reserve.

Case II. M. F., female, fourteen and one-half years old, was admitted to the hospital August 20, 1927. The parents stated that ever since the child started to walk, which was at the age of twenty months, they had noticed a limp. The limp was the only symptom of which she complained. The child was in good condition. She walked with a very marked limp on the left side, with great prominence of the trochanter and typical Trendelenberg sign. The head of the bone was felt lying very high on the posterior surface of the ilium. The roentgenogram showed the head of the femur entirely above and behind the acetabulum. There was a fairly well formed original acetabulum. There was 2½ in. of shortening.

The patient was put to bed and traction applied. The traction was gradually increased until it reached 35 lbs. The shortening was reduced 1½ in. On September 6th an open operation was performed as follows:

Through a Smith-Peterson incision, the capsule of the hip joint was exposed. It was found to be very much thickened—at least ¼ in. It was opened and turned back around the base of the neck of the femur. The head of the femur was well formed and covered with normal appearing cartilage. There was extreme anteversion of the neck. The acetabulum was then opened and found to be more shallow than normal and filled with soft fibrous material. This was removed with a curette. A skid was then inserted and the dislocation reduced by gentle prying, slight abduction and internal rotation. Following the reduction, however, the bone snapped out of place on very slight movement. The acetabulum was therefore deepened with a Doyen burr. The hip was then replaced by a similar manipulation. A chisel was then introduced into the ilium just above the rim of the acetabulum. An attempt was made to turn down the acetabular rim as a whole; this turning downward was supplemented by turning down a shelf of bone from the ilium itself. The shelf was held in place by a wedge of cortical bone. The muscles were resutured in position with interrupted No. 1 chromic sutures and wound closed in layers. A plaster of Paris spica was applied holding the limb in full extension, about 10° of abduction. Traction was allowed to maintain in position.

The patient's highest temperature following the operation was 103°F. She complained of comparatively little pain. The only postoperative complication was swelling of the vulva on the operated side, which persisted for about one week. The plaster was entirely removed at the end of seven weeks at which time the roentgenogram showed no sign of any surviving cartilage either of the head or of the acetabulum. In spite of this there appeared to be a few degrees of motion in the hip. On Dec. 17th she was discharged, walking without apparatus and with only a slight limp. She now walks with a marked limp, but her gait is progressively improving. The limb is held in the line of the body in 10° abduction. There is practically complete ankylosis, although there may be a few degrees of external rotation. There is no shortening.

This case is an example of what might be done in cases of deformity of long standing and extreme shortening. In all cases of unilateral dislocation, in a patient who would eventually have to be self-supporting, I feel that the amount of motion is entirely of secondary importance compared to stability and lack of pain. In the average patient of this type unilateral ankylosis of the hip produces very slight disability.

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EDITORIALS

A MEDICAL OFFICER IN THE CABINET

AT the time we sit before our typewriter fashioning these lines, political feeling runs high. Either one is a Hoover or a Smith "man" almost to the point of fanaticism, or else "he" doesn't give a rap one way or the other and will play golf on Election day. It so happens that the Publisher and Editor are going to kill off each other's vote, and so, in a way it may be said the "office" is neutral and this writing has no hidden political significance.

However, the election, to be decided a few days after reading these paragraphs, is not the purpose of our writing.

We would urge for your consideration and the thoughtful attention of all physicians the question of another cabinet office. The President's cabinet at Washington should have in its personnel a Medical Officer.

The matter of the health of the nation, the many ramifications of matters medical affecting the economic welfare of all peoples is of such paramount importance that this country would do well to follow and imitate other leading nations and be represented in the President's "family."

At a meeting of the Executive Council of the American Medical Editors' Association, the following resolution was made and unanimously adopted:

Be It Resolved: It is the sentiment of the American Medical Editors' Association that there should be a Medical Officer in the President's Cabinet at Washington. That such an office be created and that the interest of the medical profession should be aroused, and that editorials be written to appear in the medical journals of this country, for the purpose of eventually accomplishing this result.

This tells the story. Just how the aroused interest of the medical profession is to accomplish this undertaking we cannot say, but, in our heart, we believe the move is a good and logical one, and so urge that it be put into action.

COLLECTED ARTICLES

READERS of this issue of THE AMERICAN JOURNAL OF SURGERY will note that a large number of the contributions are from men on the staff of The Lenox Hill Hospital, New York. Since January, 1928, we have devoted most of one issue of the JOURNAL to papers from the men from the Jackson Clinic and the Battle Creek Sanatorium. We have plans for collected papers from other surgical centers. We think it a stimulating plan to have a group of men in a surgical unit unite in supplying papers for publication from time to time in a number of THE AMERICAN JOURNAL OF SURGERY. Throughout the country are many important groups doing original and exceptional work, but who hide their light under a bushel. If these gentlemen will take the hint and proceed as a unit, gather their material without reduplication and give a résumé of the work they are doing, we would be happy to hear from them. We are particularly interested in clinical end-results after check-up several years after operation. The profession is at that surgical era in which it should pause and revaluate what has gone before.

VIRGIL PENDLETON GIBNEY MEMORIAL FELLOWSHIP OF THE HOSPITAL FOR RUPTURED AND CRIPPLED

THROUGH the generous contributions of the alumni and friends of the Hospital for Ruptured and Crippled, a fellowship has been established which will be known as the Virgil Pendleton Gibney Memorial Fellowship.

The income from this fellowship will be approximately fifteen hundred dollars a year; and the incumbent thereof will have the privilege of boarding and residing at the hospital.

The idea of the fellowship is to afford an opportunity to a man who is well grounded in general surgery and who has had a certain amount of experience in orthopedic surgery, to pursue further study in the latter field, especially in that of bone pathology. The incumbent will have every opportunity for clinical study in both the In-door and Out-door departments of the hospital. He will have the privilege of carrying on laboratory investigations at the Cornell University Medical College under the direction of the heads of the departments, and also will have an opportunity to study the pathology of bone tumors under the direction of James Ewing of the Cornell and Memorial Hospital laboratories.

After a period not exceeding three months, the incumbent shall decide upon some particular line of study and investigation to which he intends to devote the major portion of his time. At the end of one year, or of the period during which he has held the fellowship, he shall present to the committee in charge a thesis which will be published as coming from the Hospital for Ruptured and Crippled and the Cornell University Medical College Laboratories, with the approval of the committee.

The committee in charge of this fellowship follows: William Church Osborn, President, Board of Managers; Samuel Fosdick Jones, M.D., Denver, Colorado; Eugene H. Pool, M.D.,; Royal Whitman, M.D.; Charlton Wallace, M.D.; William B. Coley, M.D., Chairman.

Anyone desiring to apply for this fellowship will please communicate with William B. Coley at the Hospital for Ruptured and Crippled, 321 East 42nd St., New York, N. Y.

WILLIAM B. COLEY, M.D.
Chairman.

[From Fernelius' Universa Medicina, Geneva, 1679.]

BOOKSHELF BROWSING

WILLIAM HARVEY

ARCHIBALD MALLOCH, M.D., M.R.C.P. (LOND.)

NEW YORK

PART II *

HARVEY'S TOUR ON THE CONTINENT

IN July 1630 Harvey started out with the Duke of Lennox upon a tour through France. They were in Paris for some time but we have no record of Harvey's doings there; perhaps research in Paris might reveal some interesting details. In Paris Gui Patin referred to the followers of Harvey as the *circulateurs*;[1] this is playful but the Latin *circulator* means quack or charlatan. There is a letter in the Bodleian Library written by Harvey from France to Viscount Dorchester, Secretary of State, in which Harvey says that he hopes the rumour that his place at Court had been taken by another man, is not true. One passage which shows that Harvey was still busy with his study of animals must be quoted. By the way, Harvey's hand is as difficult as ever:

> the miseryes of the Cuntreyes we have passed & the hopes of our good success & all such news yo^{r} Hon: hath from better hands, I can only complayne, that by the waye we could scarce see a dogg crow kite Raven or any bird, or any thinge to anatomise only sum few miserable people the reliques of the war & the plauge [*sic*] where famine had made anatomies before I came. it is scarce credible in soe ritch, populous & plentifull cuntryes as these weare that soe much misery desolation & poverty & famine should in soe short a time be, as we have seen. I interpret it well, y^{t} wilbe a greate motive for all heare to have & pcure an assurance of a setled peace. it is time to leave fighting when, ther is nothing to eate nothing to be kept & gotten & the same partyes robb on the other if they gett but once out of sight
>
> Y^{r} Hon:
> Humble servant
> Will. Harvey.[2]

This shows, too, that he was well aware of what went on in the political world for the Mantuan war ceased not long after.

The Duke's party visited Blois amongst other places and I like to think that Harvey made a pious pilgrimage to Ambois not far off, where Leonardo had died in 1519, but it is not likely that Harvey knew of him as a skilful anatomist. Nor is it probable that when they visited Spain Harvey thought of Servetus.

In 1633 Harvey accompanied Charles I on his journey to Scotland when the latter was crowned at Holyrood. Harvey gives a very picturesque account, in his book on the generation of animals, of the gannets or Solon geese which covered Bass Rock, an island in the Firth of Forth, and writes

* This concludes Dr. Malloch's article, the first part of which appeared in Bookshelf Browsing, AMERICAN JOURNAL OF SURGERY, September, 1928, Vol. 5, No. 3, p. 302.

that he cannot believe that geese were generated from fruits of certain trees that had fallen into the sea.

Fig. 7. Harvey's letter to Lord Dorchester. (By permission of Bodley's Librar an.)

ST. BARTHOLOMEW'S HOSPITAL

By October of this year Harvey had returned to London and at a meeting of the President, Governors, the surgeons, and the apothecary of St. Bartholomew's Hospital he proposed "some particulars concerning the good of the poore of this howse and reformacon of some orders conceaved to be in this howse." I quote some of these suggestions which were adopted as proposed:

8. That the Chirurgions, in all difficult cases or where inward physic may be necessary, shall consult with the Doctor, at the times he sitteth once in the week and then the Master [i.e., the Surgeon] himself relate to the Doctor what he conceiveth of the cure and what he hath done therein. And in a decent and orderly manner proceed by the Doctor's directions for the good of the poor and credit of the house.

9. That no Chirurgion or his man do trepan the head, pierce the body, dismember [amputate], or do any great operation on the body of any but with the approbation and by the direction of the Doctor (when conveniently it may be had) and the Chirurgions shall think it needful to require.

15. That the Matron and Sisters shall signify and complain to the Doctor, or Apothecary in the Doctor's absence, if any poor lurk in the house and come not before the Doctor when he sitteth or taketh not his physic but cast it away and abuse it.

16. That the Apothecary keep secret and do not disclose what the Doctor prescribeth nor the prescriptions he useth but to such as in the Doctor's absence may supply his place and that with the Doctor's approbation.

On the other hand, another of Harvey's proposals was protested against by the surgeons. It was:

12. That every Chirurgion shall shew and declare unto the Doctor whensoever he shall in the presence of the patient require him, what he findeth and what he useth to every external malady; that so the Doctor being informed may better with judgment order his prescriptions.[3]

It would have been unfair to make the prescriptions of the surgeons public and not those of the physicians which were kept in a locked book, and guarded with jealous care as well.

HARVEY AND THE WITCHES

Harvey in 1634 was concerned with a sad chapter of human deception (Osler),[4] but had it not been for him events might have been much sadder still. I refer to the affair of the Lancashire Witches. All the trouble arose through the story invented by a little boy of ten years, as he later confessed, to excuse himself when he had been at play instead of at school. His fairy tale of a dog being turned into a woman, another into a child, of the child into a horse, and of several witches in a barn would, we hope, have little credence now but it must be remembered that just the year before, in 1633, while Charles I and Harvey were in Scotland it was suspected that witches had had a hand in

raising the great storm which caused such danger to the King at sea. As a result of the lad's tale seven women were thrown into gaol and three of these died. The Bishop of Chester, who examined them, evidently thought that intimate relations had existed between them and the Devil.

The women were brought to London to the "Shippe Taverne, Greenwich," and possibly at Harvey's suggestion the King ordered his two surgeons to choose some midwives and examine the suspected witches. The examination took place in Surgeons' Hall in Monkwell Street. Nothing extraordinary was found by the seven surgeons and ten midwives who signed the report, no excessive number of the organs which distinguish the mammalian from other animals. Harvey, apparently, was not present but it is recorded that the midwives were to be instructed by "Mr. Dr. Harvey." The lives of the four women were saved and we have nothing but praise for Harvey on this occasion, but it was not until 1720 that the last trial for witchcraft took place in England and not until 1735 that the Act of James I, under which proceedings were taken, was repealed. Even Sir Thomas Browne wrote of "the Dogs and Cats that usually speak unto Witches" and gave evidence at a trial in 1664, which helped to convict two women of witchcraft.[5]

Quite recently another story about Harvey and witches has been quoted again by Dr. Letitia Fairfield; it appeared in the *Gentlemen's Magazine* for 1832 (part I, 405–410) from an account presumably written about 1685. It is later printed also in Professor Notestein's "History of English Witchcraft:"[6]

It is easy in discussing the Lancashire affair to miss a central figure. Frances Dickson, Mary Spencer, and the others, could they have known it, owed their lives in all probability to the intellectual independence of William Harvey. There is a precious story about Harvey in an old manuscript by an unknown writer, that, if trustworthy, throws a light on the physician's conduct of the case. The letter seems to have been written by a justice of the peace in Southwestern England about 1685. He had had some experience with

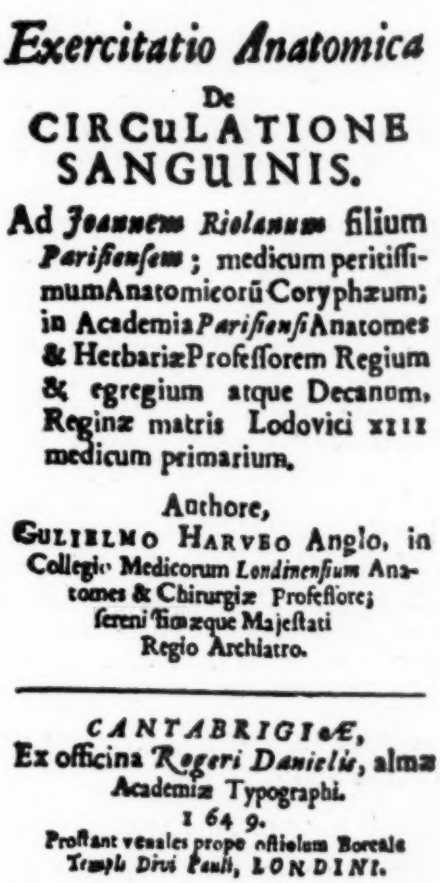
Exercitatio Anatomica
De
CIRCULATIONE
SANGUINIS.
Ad *Joannem Riolanum* filium
Parisiensem; medicum peritissimum Anatomicorũ Coryphæum;
in Academia *Parisiensi* Anatomes
& Herbariæ Professorem Regium
& egregium atque Decanum,
Reginæ matris Lodovici XIII
medicum primarium.
Authore,
GULIELMO HARVEO Anglo, in
Collegio Medicorum *Londinensium* Anatomes & Chirurgiæ Professore;
sereni Fimæque Majestati
Regio Archiatro.
CANTABRIGIÆ,
Ex officina *Rogeri Danielis*, almæ
Academiæ Typographi.
1649.
Prostant venales prope ostiolum Boreale
Templi Divi Pauli, LONDINI.

Fig. 8. Title-page of the first edition of Harvey's other work on the circulation. (Reproduced by permission of the University of Nebraska.)

witches, and he was prompted by them to tell a story of Dr. Harvey, with whom he was very familiarly acquainted. "I once asked him what was his opinion concerning witchcraft; whether there was any such thing. Hee told mee, he believed there was not." Asked the reasons for his doubt, Harvey told him that "when he was at Newmarket with the King (Charles I) he heard there was a woman who dwelt at a lone house on the borders of the Heath who was reputed a witch; that he went alone to her and found her alone at home . . . . Hee said shee was very distrustful at first, but when hee told her he was a wizard, and came purposely to converse with her on their common trade, then shee easily believed him; for say'd hee to me, 'You know I have a very magicall face!' " The physician asked her where her familiar was and desired to see

him, upon which she brought out a dish of milk and made a chuckling noise as toads do, at which a toad came from under the chest and drank some of the milk.

Harvey now laid a plan to get rid of the woman. He suggested that as fellow witches they ought to drink together and that she procure some ale. She went out to a neighboring ale-house, half a mile away, and Harvey availed himself of her absence to take up the toad and cut it open. Out came the milk. On a thorough examination he concluded that the toad "no ways differed from other toades," but that the melancholy old woman had brought it home some evening and had tamed it by feeding and had so come to believe it a spirit and her familiar. When the woman returned and found her "familiar" cut in pieces, she "flew like a Tigress" at his face. The physician offered her money and tried to persuade her that her familiar was nothing more than a toad. When he found that this did not pacify her he took another tack and told her that he was the King's physician, sent to discover if she were a witch, and, in case she were, to have her apprehended.[7]

No date is given of this strange examination of a "Familiar."

THOMAS PARR

Harvey's account of the post mortem he performed in 1635 on the body of Thomas Parr, who was reputed to have been one hundred and fifty-two years and nine months old, was published for the first time in Dr. Bett's "De ortu et natura sanguinis," London, 1669, octavo. "Old Parr" had been brought up from Shropshire to London by the Earl of Arundel to show the King as "a remarkable sight." I quote a passage in which Harvey tells why the old man died and also something of London Town at that time:

> The cause of death seemed fairly referrible [*sic*] to a sudden change in the non-naturals, the chief mischief being connected with the change of air, which through the whole course of life had been inhaled of perfect purity,—light, cool, and mobile, whereby the praecordia and lungs were more freely ventilated and cooled; but in this great advantage, in this grand cherisher of life this city is especially destitute; a city whose grand characteristic is an immense concourse of men and animals, and where ditches abound, and filth and offal lie scattered about, to say nothing of the smoke engendered by the general use of sulphurous coal as fuel, whereby the air is at all times rendered heavy, but much more so in the autumn than at any other season. Such an atmosphere could not have been found otherwise than insalubrious to one coming from the open, sunny and healthy region of Salop; it must have been especially so to one already aged and infirm.
>
> And then for one hitherto used to live on food unvaried in kind, and very simple in its nature, to be set at a table loaded with variety of viands, and tempted not only to eat more than wont, but to partake of strong drink, it must needs fall out that the functions of all the natural organs would become deranged. Whence the stomach at length failing, and the excretions long retained, the work of concoction proceeding languidly, the liver getting loaded, the blood stagnating in the veins, the spirits frozen, the heart, the source of life, oppressed, the lungs infarcted, and made impervious to the ambient air, the general habit rendered more compact, so that it could no longer exhale or perspire—no wonder that the soul, little content with such a prison, took its flight.[8]

ANOTHER CONTINENTAL TOUR

Possibly the Earl of Arundel and Harvey met for the first time through this incident of Parr's visit to London; at any rate "Dr. Harvey" became the Earl's physician and was chosen to accompany the diplomatic mission when the Earl was sent to Vienna by Charles I as Ambassador Extraordinary to the Emperor Ferdinand II "in the final stage of the Palatinate discussion." The Earl of Arundel had very artistic tastes and so had Charles I; Basil Feilding, later second Earl of Denbigh, was already in Venice nominally as English Ambassador but in reality to collect works of art, and the Rev. William Petty was in Florence on the same errand for the Earl of Arundel. Harvey appears in a new light as an amateur of art through the discovery in 1911 of some precious letters written by him to Feilding, which have been purchased and presented to the Royal

College of Physicians, the gift of Sir Thomas Barlow.

The mission started out in April 1636, visited Holland, travelled up the Rhine, and finally down the Danube to Linz where the visitors were received by the Emperor and Empress. The Earl of Arundel said jokingly that "honest little Doctor Harvey meant to convert" the Jesuits at Cologne. Honest little Dr. Harvey, as the Earl described him, was fifty-eight years old by this time but was still in search of specimens, it being said of him, " . . . he would still be making observations of strange trees and plants, earths, etc., and sometimes he was like to be lost, so that my Lord Ambassador would be really angry with him for there was not only danger of thieves but also of wild beasts."[9]

Caspar Hofmann, then Professor of Medicine at Nuremberg had not received the new doctrine of the circulation in its entirety, so Harvey wrote asking that he have the opportunity of making a demonstration, pointing out that he did not wish Hofmann to "derogate from the faith of an honest man, not altogether foolish or insane, who has had experience in such matters for a long series of years."[10] The public dissection, in the presence of Hofmann on Harvey's return trip, was convincing to everyone but the man for whom it was intended. It is said that Hofmann continued in his objections, so Harvey finally threw down his knife and left the theatre.

A passage in one of Harvey's letters from Linz must not be omitted:

> Yesterday my lord was feasted by the nobility att the house of the Count of Milan, the cheife major-domo of his Majestie. We drunk hard, and had many expressions and many good wishes. What will succeed is of noe [*sic*] less expectation and consequences than our desires are to know it.[11]

At Augsburg on the return from Vienna and Prague, Harvey left the mission, setting out on horseback for Venice with two attendants. Alas! He did not reach the town, but on account of fear of the plague, was put into quarantine at Treviso, eighteen miles from his goal. There are several letters beseeching Lord Feilding to

Fig. 9. Frontispiece of the first edition (London, 1651).

have him released of which I quote the first which reads as follows:

> 1638, Aug. 3–13. Treviso.—M y sweete lord, I came this morning to the gates of Treviso with greate joy, and hoped this night to have had the happiness to have beene with you att Venice, butt I have receyved heare a very unjust affront, being stayed and commanded by this podesta to have gone into the lazaretto, without any cause or suspition alledged. I tooke my first *fede* [certificate of health] under the seale of Ratisbone, a place free, and now destined, as your Eccellency knoweth, for the meeting of the Emperor and all the rest of the princes, which yf it had not beene soe, they would not have com thither, it being infected or suspected. Since, in every place as I came, I caused my *fede* to be underwritten, soe that there is no ground for them to lay any suspition upon me. And att this sentence on me by the

podesta (that I should goe to the Lazarett) I absolutely refused, and sayd and offered to shewe that I had the pass and recommendation

FIG. 10. Engraved title of the Elzevir (1651) edition with London imprint. Other copies have Amsterdam imprint. Note the motto on the egg.

of his Majesty the King of Greate Brittane and of the Emperors Majesty and of my lord Embassador his Excellency, and that I had to goe to princes and men of quality, and that my business required expedition, and desier'd they would not hinder me, butt, as my passes required, further me and that I mought not bring that suspition and infamy on me, besides my own security, to goe to such a place as lazaretto, whear they use to putt infected persons, and that I had shewed them sufficient *fede*. Notwithstanding all this, heare I am to lye for ought I see in the open base [*sic*] feilds, God knows how long. The podesta refuseth to see or reade my passes, and I cannot cum att him to speake and use my reasons. I am afrayed this lying in the feild will doe me hurt in my health. I beseech your Eccellency to lament hearof. It is unjust to proceed with any man thus without cause and otherwise then Venetians are used in Ingland or soe merit to be used heare, and otherwise then is fitting for the respects there shold be used to the passes forenamed.

I pray pardon this scribling on the grass in the feild, and procure with all expedition my freedom from this barbarous usadg. Your distressed frend and humble servant of your Eccellency.[12]

Still nothing was done except the authorities offered to improve his quarters a little, but Harvey thought that was "unseasonable like phisick when a man was ded"[13] and refused to change his lodging. After having been there for about a week, Harvey writes "I have a sciatique in my right thigh and legg that much discorageth me, and maketh me lame."[14] We do not know how long he was in quarantine but the last of a number of letters from Treviso in the same strain was dated August 16–26. The next one is from Florence and we find that Harvey's spirits had revived for he had been entertained quite magnificently by Ferdinand II, Grand Duke of Tuscany from 1620–1670, the lover of science under whose patronage the Accademia del Cimento was founded in 1657 even before the Royal Society and the Académie des Sciences at Paris.

The Earl of Arundel had become worried about Harvey and wrote to the Rev. William Petty at Florence making inquiries and saying quite affectionately: "I do hope I shal see the little perpetual mov[ement] called Dr. Hervye here before my go[ing]."[15] And does not that phrase describe the man whose active mind in an active body gave birth to the idea of the movement of the heart and blood? The Pilgrims' book of the English College at Rome shows that Harvey dined there on the 5th of October with another Kentish man, also an M.D. of Padua, Dr. Ent. Early in November Harvey had rejoined the party at Ratisbon and shortly afterwards they returned to London.

CIVIL WAR AND OXFORD

In 1642 Parliament prepared for war against the King and during the summer

there was a certain amount of lawlessness from which Harvey suffered grievously for his official lodgings in Whitehall were entered, and he writes:

> Let gentle minds forgive me, if recalling the irreparable injuries I have suffered, I here give vent to a sigh. This is the cause of my sorrow:—Whilst in attendance on His Majesty the King during our late troubles, and more than civil wars, not only with the permission but by the command of the Parliament, certain rapacious hands not only stripped my house of all its furniture, but, what is a subject of far greater regret to me, my enemies abstracted from my museum the fruits of many years of toil. Whence it has come to pass that many observations, particularly on the generation of insects, have perished with detriment, I venture to say, to the republic of letters.[16]

The lost books of Galen, I believe, are not so much missed as are these writings of Harvey.

Harvey left London with the King and we know from a manuscript in the hand of Dr. Percival Willoughby that he visited the latter at Derby. In the course of a gynecological talk he described a rare form of cancer which he called "honey-comb,"[17] forgotten until 1920 when Dr. H. R. Spencer described a case in his Lettsomian Lectures.[18] Listen to Willoughby's words in praise of Harvey whom we should venerate as the father of modern midwifery as we have of modern physiology:

> I know none but Dr. Harvey's directions, and method, the which I wish all midwives to observe, and follow and oft read ouer [*sic*] and ouer again and in so doing they will better obserue [*sic*] and understand and remember the sayings and doings of that most worthy, good and learned D^{r} whose memory ought to bee had for euer [*sic*] in great esteem with midwiues [*sic*] and child bearing women.[19]

Harvey was at the battle of Edgehill not far from Oxford in October 1642, in charge of the two little princes. It is said that he read a book under a hedge until things grew too hot for him, and he began his work of dressing wounds. After the battle the King took up his residence in Oxford, Harvey accompanying him, where they remained during the siege. It is difficult to think that Harvey did not join with

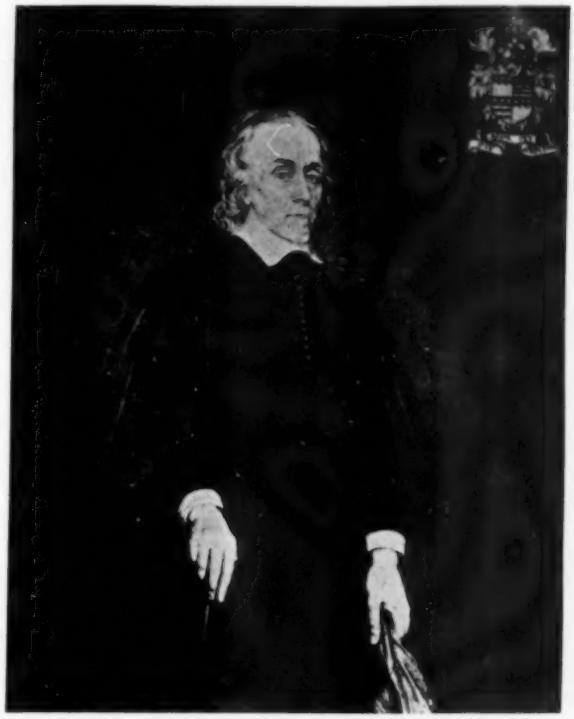

Fig. 11. Portrait (? by Van Dyck) now owned by Mrs. Franck Carr. (Reproduced with Sir D'Arcy Power's permission from "Portraits of Dr. William Harvey," Oxford University Press, London, 1913.)

Wallis, Seth Ward, Bathurst, Willis, Petty and others who made up the "Philosophical" or "Invisible College." They had had to leave London for Oxford, but some years later, after returning, they founded the Royal Society. No record has been found of Harvey's presence at these meetings but he certainly carried on dissections in Oxford and observed the development of the chick with Bathurst in the latter's rooms. Harvey was also very kind to young Charles Scarburgh, took him into his apartment and said: "Prithee, leave off the gunning and stay here; I will bring thee into practice."[20] Scarburgh took the advice, quenched his military ardour and later became physician to Charles II and James II and was knighted. Harvey was made an honorary M.D. of Oxford in 1645 and also Warden of Merton College through

the King's influence, as Parliament had given his place to another man at St. Bartholomew's Hospital. I like to think

Fig. 12. Portrait (by Jansen) at the Kent and Canterbury Hospital. (Reproduced from H. R. Spencer's "Harveian Oration," Harrison and Sons, London, 1921.)

of Harvey retiring to that beautiful library at Merton, perhaps to read and handle the "Continens" of Rhazes, printed at Brescia in 1486, which weighs 21½ pounds! Harvey could not have been troubled much by inquiring undergraduates for during the siege there was "scarce the face of a University left." The town finally surrendered to the Parliamentary Forces in 1646 and King Charles escaped disguised as a servant.

Harvey returned to London and stayed with his brothers in turn. Riolan published his book "Encheiridium anatomicum et pathologicum" from Leyden in 1648 and his "Opuscula anatomica nova"[21] the following year in criticism of the circulation of the blood and in 1649 Harvey's "Disquisition"[22] in reply appeared from Cambridge. In this book Harvey says "I had much to put forth in my medical Observations and Pathology, which, so far as I know, has as yet been observed by no one," so it is likely he was producing another book. We also know he was busy with his work on generation and that each year he continued to deliver the Lumleian Lectures. In his old age he mastered Oughtred's "Clavis mathematica"[23] and worked away at its problems.

HARVEY'S ECCENTRICITIES

Eccentricities, the whims, and fancies of a great man, will always interest us; to hear of them seems to bring us so much closer to him. "That he was humoursome and would sit down exactly at the time he had appointed dinner whether the company was come or not. That his saltcellar was always filled with sugar which he used to eat instead of salt."[24]

He was very fond of drinking coffee with his brother Eliab, before coffee houses were established and in his will he left his "coffy-pot" to a niece. "That he used to walk out in a morning combing his hair in the field."[24]

Aubrey writes of Harvey's gout:

> He was much and often troubled with the gout, and his way of cure was thus: He would sit with his legs bare, though it were frost, on the leads of Cockaine House, put them into a pail of water till he was almost dead with cold, then betake himself to his stove, and so 'twas gone.[25] [And of his disturbed sleep]: His thoughts working would many times keep him from sleeping, in which case his way was to rise from his bed and walk about his chamber in his shirt till he was pretty cool and then return to his bed and sleep very comfortably.[26]

Aubrey, for whose gossip we shall always be thankful, also says of Harvey, "He did delight to be in the dark, and told me he could then best contemplate . . . whilst at the house at Combe in Surrey, he had caves made in the ground in which he delighted in summer-time to meditate."[27]

Would that we took more time for meditation!

THE "DE GENERATIONE"

Charles I was beheaded in 1650 and Dr. Ent describes Harvey as he found him about Christmas-time of that year:

I found him, Democritus-like, busy with the study of natural things, his countenance cheerful, his mind serene, embracing all within its sphere. I forthwith saluted him and asked if all were well with him? "How can it be," said he, "whilst the Commonwealth is full of distractions, and I myself am still in the open sea? And truly," he continued, "did I not find solace in my studies, and a balm for my spirit in the memory of my observations of former years, I should feel little desire for longer life. But so it has been, that this life of obscurity, this vacation from public business, which causes tedium and disgust to so many, has proved a sovereign remedy to me."[28]

After Harvey had shown Ent his book on generation he was at length persuaded by the younger man that it should be published. Ent carried this work through and the passage I have quoted is from his dedicatory epistle addressed to the President and Fellows of the Royal College of Physicians.

The work, entitled "Exercitationes de Generatione Animalium. Quibus accedunt quaedam De Partu: de Membranis ac humoribus Uteri: & de Conceptione," was published by Pulleyn, in St. Paul's Churchyard, London, 1651, quarto, and three other editions appeared from Amsterdam in the same year. The frontispiece of the London, and the engraved title of one of the Amsterdam editions bear the motto *Ex ovo omnia*, all animals are produced out of ova, which gives the key to Harvey's view on generation and development. Like Aristotle, whom he delights to call "the Philosopher," Harvey believed in epigenesis, that the organs of the embryo arise by new formation and not by mere enlargement of a preexisting condition. Under Harvey's guidance we can make out what can be seen by the naked eye or magnifying glass of changes day by day in the development of the hen's egg and we learn what the exercise of trained powers of observation can tell us of the habits of fowls and animals, especially deer, which he studied in Windsor Forest, and of the structure and function of the parts as revealed by careful dissection. In his introduction Harvey writes, "And truly in such pursuits it is sweet not merely to toil, but even to grow weary, when the pains of discovery

Fig. 13. Hempstead Church. (From Sir B. W. Richardson's "Disciples of Aesculapius," E. P. Dutton & Co., New York, 1901.)

are amply compensated by the pleasures of discovery."

There are passages in this work worth recording which show us how familiar Harvey was with the hunting parties of his royal Master and with the ways and days of country folk. These are descriptions which stir the blood with their beauty and vividness, especially when he tells us of the shepherd that knows every one of his sheep and to which ewe each lamb belongs. I cannot resist a quotation:

> . . . there are some who, in hunting, when there are some forty hounds upon the trace of the game and all are giving tongue together, will nevertheless, and from a distance, tell which dog is at the head of the pack, which at the tail, which chases on the hot scent, which is running off at fault; whether the game is still running or is at bay; whether the stag has run far, or has but just been raised from his lair. And all this amid the din of dogs, and men, and horns, and surrounded by an unknown and gloomy wood. We should not, therefore, be greatly surprised when we see those who have experience telling by what hen each particular egg in a number has been laid. I wish there were some equally ready way from the child of knowing the true father.[29]

He recognized one of the hard laws of Nature; who has expressed it better?

> The eternity of things is connected with the reciprocal interchange of generation and decay; and as the sun, now in the east and then in the west, completes the measure of time by his ceaseless revolutions, so are the fleeting things of mortal existence made eternal through incessant change, and kinds and species are perpetuated though individuals die.[30]

He refers to Parisanus, one of the men who criticized the doctrine of the circulation and one who believed that the liver was "the author and fashioner of the blood." Listen how playfully he refers to his critics: "Among the number of modern abettors of such views, Parisanus has of late with confidence enough, but little skill, been singing to the old measure."[31] It was with pardonable pride that he was able to write: "The admirable circulation of the blood originally discovered by me, I have lived to see admitted by almost all; nor has aught as yet been urged against it by anyone which has seemed greatly to require an answer."[32]

He did not enunciate Agassiz's law, but knew that the embryo developed through stages which might be likened to the adult stages of the lower animals, namely, in a human embryo of the second month ". . . in shape like a little frog . . . The face was the same as that of the embryo of one of lower animals—the dog or cat, for instance, without lips, the mouth gaping, and extending from ear to ear." In the human embryo of the fourth month he noted that: "The intestinum coecum, that appendix of the colon, was empty as in the adult, and apparently superfluous, not as in the lower animals—the hog, horse, hare, constituting as it were another stomach."[33]

Although he likens man to animals, listen to how he tells of the differences between them and of how man was able to rise above the lower creatures:

> Man comes into the world naked and unarmed, as if nature had destined him for a social creature, and ordained him to live under equitable laws and in peace; as if she had desired that he should be guided by reason rather than be driven by force; therefore did she endow him with understanding, and furnish him with hands, that he might contrive what was necessary to his clothing and protection. To those animals to which nature has given vast strength, she has also presented weapons in harmony with their powers; to those that are not thus vigorous, she has given ingenuity, cunning, and singular dexterity in avoiding injury.[34]

A passage a little farther on might make us think that we are reading out of Darwin's "Courtship of Animals" and he also depicts the survival of the fittest and the struggle for existence.

Harvey gives a number of practical pointers for gynecological and obstetrical practice, for instance, he realized that the symphysis pubis becomes loosened during the late stages of pregnancy, and also he invented a speculum for the giving of intrauterine injections.[35]

Harvey, however, was wrong in believing that efforts and movements of the fetus aid delivery.[36] Galen, centuries before, said that the fetus did not help by its movements and Fabricius,[37] Harvey's teacher, thought delivery was due to the force of gravity exerted upon the fetus.

One of Harvey's observations has been of the greatest medico-legal importance in determining whether a child was born alive or dead:

> . . . when he observed that the lungs of foetuses which had breathed stretched and dilated by the air put on a whiter colour, and by this observation of the different complexion you may discover whether a mother brought her child alive or dead into the world; for instantly after inspiration the lungs change colour, which colour remains, though the foetus die immediately after.[38]

In his seventy-first and seventy-second exercises, at the end of that part of his book which deals with generation, Harvey discusses *calidum innatum*, or innate heat, and *humidum primigenium*, or radical

moisture, because he felt that: "Many pride themselves upon the use of these terms, without . . . rightly understanding their meaning. There is, in fact, no occasion for searching after spirits foreign to, or distinct from, the blood."[39]

Harvey, as we see, endows the blood with wonderful properties. He could go so far and no farther, for Mayow had not yet appeared to tell of that part of the air necessary for both combustion and life which Priestley later prepared and Lavoisier called oxygen. In these last two chapters Harvey's philosophical discussions, harking back to Aristotle, sound well-nigh unintelligible to us. Take for instance the paragraph:

> We must, therefore, make the distinction and say, that whilst no primary agent or prime efficient produces effects beyond its powers, every instrumental agent may exceed its own proper powers in action; for it acts not merely by its own virtue, but by the virtue of a superior efficient.[40]

We smile now, as others will do at our puerile efforts when looked at through the eyes of future ages, not realizing how far we are from answering the riddle of life.

BENEFACTIONS TO THE COLLEGE

So much for Harvey's work on generation, and we pass now to his later years. I was once lucky enough to come across a reference to Harvey in a letter written in December 1651 which is rather amusing when one thinks how difficult it would be for Harvey to operate upon himself. It is contained in a letter from John Finch to his sister, Anne Viscountess Conway:

> I was on Saturday with Sir Kenelme Digby where I had some philosophical Discourse; and he had heard of your marriage, but wondered with me at the story of Dr. Harvey; I must confesse I have scarce faith enough to believe [*sic*] that he would Cutt himselfe but rather beleive he voyded that stone you spoke of then cutt it out for I doe not see it was possible for him in two dayes to be able to goe abroad otherwise.[41]

It is the duty of us all to help our own medical libraries and knowing how widely read Harvey was and that he knew the value of the works of great authors we are not surprised that in 1630 he had subscribed twenty pounds towards the purchase of a site and in 1632 had drawn up new rules for the library of the College of Physicians.[42] In July 1651, at an extraordinary *comitia*, the President of the College, Dr. Prujean, read out the following proposition:

> If I can procure one that will build us a library, and a repository for simples and rarities, such a one as shall be suitable and honorable to the College, will you assent to have it done, or no, and give me leave, and such others as I shall desire, to be the designers and overlookers of the work, both for conveniency and ornament?[43]

Of course this offer was accepted with alacrity and it is likely that the name of the anonymous donor was discovered, for the College voted the erection of a statue to Harvey which bore an inscription commemorating his epoch-making discovery of the circulation and his work upon generation. Unfortunately this statue was destroyed in the Great Fire of London in 1666. The College occupied a site at Amen Corner and Harvey's addition was built in the garden; Aubrey again comes forth with useful information: ". . . a noble building of Roman architecture (of rustic work, with Corinthian pilasters), comprising a great parlour, a kind of convocation house for the fellows to meet in below, and a library above."[44]

Harvey not only gave the building but also books for the library and surgical instruments and curiosities for the museum. Perhaps the tanned human skin which he had presented in 1634 was deposited there. Although the building has long ceased to exist, the Librarian to this day is given the title, "Harveian." The library was opened on the 2nd of February 1653, when Harvey welcomed the College with a splendid feast and made over the title deeds.

Harvey was chosen President of the College in 1654 but was not present at the meeting. When approached, he declined the offer owing to old age and poor health, but his suggestion that Dr. Prujean be reelected was acted upon. Harvey continued his Lumleian Lectures until July 28, 1656, when he resigned, said good-bye to the Fellows and made over to the College forever his paternal estate of Burmarsh, Romney Marsh, Essex, which was then valued at fifty-six pounds a year. Harvey had three objects in view in this gift: first, to establish an annual feast; second, to found an annual oration at which the benefactors of the College should be remembered, the Fellows and members of the College exhorted to study out the secrets of Nature by way of experiment, and, most important even for us of this day, they were to be urged to continue in love and affection amongst themselves; and third to provide for a Librarian who would also have the museum under his care. The income from his estate was sufficient for the feast, a gratuity for the orator, and a salary for the Librarian. The first of these orations of which I can find note was delivered in 1656 by one Edward Emily[45] and up to 1865 they were always in Latin. At present they are held in the afternoon of St. Luke's Day on the 18th of October and in the evening the banquet takes place. Thus the memory of the great Harvey is kept green as one who was present on one of these occasions realizes full well, the benefactors are brought to mind, and at the dinner the Fellows meet convivially. The Library contains a wonderful collection of medical and other classics.

HIS DEATH AND WILL

William Harvey died at Roehampton in the house of his brother Eliab on the 3rd of June, 1657, evidently of cerebral hemorrhage. He was buried at Hempstead in Essex about fifty miles from London, the funeral procession consisting of many Fellows of the College starting out on the 26th of June. The body was "lapt in lead" and, thus without a coffin, was laid in the vault beneath the "Harvey Chapel" which had been built by Eliab Harvey on the north side of the church. This tomb became ruinous and on St. Luke's Day, the 18th of October, 1883, his remains in the leaden case were placed in a white marble sarcophagus within the church. The President and twenty-six Fellows of the College were there, of whom that devoted disciple of Harvey, and later President of the College, Norman Moore, was the youngest.

Harvey's will,[46] in his own handwriting, was written between July 1651 and February 1652. It is a long, interesting document and remarkable for the number of individual bequests to members of his own and of his wife's family and to his servants. The remainder of his lands were given to his "loving brother Eliab and his heirs."

He did not forget the College for which he had laboured so long:

> Touching my bookes and householdstuffe Pictures and apparell of which I have not already disposed I give to the Colledge of Physicians all my bookes and papers and my best Persia long Carpet and my blue sattin imbroyedyed Cushion one paire of brasse Andirons with fireshovell and tongues of brasse for the ornament of the meeting roome I have erected for that purpose.[47]

The bequests to his two favourite young friends in the Profession are as follows:

> Item I give my velvet gowne to my lo friend Mr Doctor Scarbrough desiring him and my lo friend Mr Doctor Ent to looke over those scattered remnant [*sic*] of my poore Librarie and what bookes papers or rare collections they shall thinke fit to present to the Colledge and the rest to be Sold and with the money buy better And for their paines I give to Mr Doctor Ent all the presses and shelves he please to make use of and five pounds to buy him a ring to keepe or weare in remembrance of me And to Doctor Scarbrough All my little silver instruments of surgerie.[48]

The meal, if such it has been, has already lasted far too long but may I,

"by way of dessert"—to borrow a Harveian phrase—make one more quotation, this time from the stone below the Master's bust in Hempstead Church?

William Harvey, at the mention of whose honourable name all academies rise up out of respect, who was the first after many thousand years to discover the circulation of the blood, and so brought health to the world and immortality to himself.[49]

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BOOK REVIEWS

This is an important volume.[1] It is a work that may well be in the library of every physician. This statement is not qualified. The specialist, the general practitioner, the laboratory worker will find it interesting and instructive reading. It is a book that may serve as a reference work, or one to be read during the leisure hours at the close of a working day.

The volume is of 1206 pages and the illustrations and charts, though not many in number, are used to more fully explain the text. Many nationally known authors have written the eighty-three chapters necessary to cover the subjects. Space does not permit us to list each chapter subject. The book opens with a chapter by Herbert C. Ward on "The Newer Knowledge of the Morphology of Bacteria." We note chapters on "Bacterial Associations," "Anerobiosis," "Bacteria in Dairy Products," "The

[1] The Newer Knowledge of Bacteriology and Immunology. Edited by Edwin O. Jordan & I. S. Falk. 8vo, cloth. Pp. 1206, illus. Chicago, The University of Chicago Press, 1928.

Bacteria of Food Poisoning," "Filterability of Micro-organisms," "Precipitins and Their Applications," "Local and Tissue Immunity," "Origin of Antibodies," and the closing chapter, "Chemotherapy of Bacterial Diseases." We quote these merely to give an inadequate idea of the delightful topics between its covers.

A worthwhile and up-to-date summary of advance in fields in which unusually rapid progress has been made during the last decade.

We earnestly recommend it to all physicians.

The publishers have presented a French edition of Prof. Economo's painstaking work on the cellular structure of the cerebral cortex.[1] This volume is less detailed than the author's exhaustive treatise published in Germany several years ago, but gives a complete though more general view of the problem.

The variations in formation of the cells in different areas of the cortex are detailed and a relation to function is emphasized. Prof. Economo also points out different limits to the lobes and areas of the cortex than have hitherto been accepted.

The book is beautifully illustrated, 46 photomicrographs appearing here for the first time. The work is of inestimable value to workers in all fields but is especially important as the basis for studies in the variations of cortical structure in different physiological states and in disease.

This text[2] would seem to hold as much interest for the radiologist as for the surgeon and is one which any member of the profession in general practice can read with pleasure and benefit as well as the audience for whom it is obviously intended.

The importance which the gall bladder and its appendages have assumed in the last few years, makes a text on the subject one of general interest. Coming as this does from the Washington University of St. Louis, and more particularly from the pen of Dr. Graham and his associates, it has an added value. We have in it a concise description of our knowledge of the subject from all angles.

One very commendable feature is the consideration given to contiguous organs. This is as it should be, because certainly no pathological condition of any one organ can exist without reactions in adjacent ones.

The reviewer feels Chapters II and VIII to be of special value and would emphasize this to the general reader. Chapter IX, while short when one considers the subject and amount of attention that has been devoted to it by other writers, is a clear cut presentation of the surgical procedures which the authors deem the preferable ones for presentation. Evidently, this chapter is the selection of a surgeon of wide experience and ripe judgment who has given much thought to its preparation.

Fault can be found with the book, (and this same statement can practically be made of any book), but its value so far outweighs its deficiencies as to completely overshadow the latter.

The fourth edition of this well known text, GYNECOLOGY,[1] presents so much new material as to have necessitated a complete resetting. The present edition retains the high standard of the former editions.

To review the new material would be out of the question in a critique of this length. Enough to say that the text stands as a present-day presentation of gynecology which is on a par with any single volume covering the subject and the superior of most.

Volume II of this splendid work[2] begins with a short chapter on dosage. This is followed by a clinical section of nineteen chapters covering all the conditions in which Radiumtherapie has been found useful. The illustrations, including twenty-five in color, leave little to be desired. All in all this work is to be recommended as one of the most practical and up-to-date books on Radiumtherapie that has been published in any language.

A small book[3] of about 200 pages, the result of public lectures given by various authorities

[1] L'ARCHITECTURE CELLULAIRE NORMALE DE L'ÉCORCE CÉRÉBRALE. By Constantin v. Economo, 8vo, paper. Pp. 183, 61 illus. Paris, Masson et Cie, 1927.

[2] DISEASES OF THE GALL BLADDER AND BILE DUCTS. By E. A. Graham, M.D., W. H. Cole, M.D., G. H. Copher, M.D. and S. Moore, M.D. 8vo, cloth. Pp. 477, 232 illus. Phila., Lea & Febiger, 1928.

[1] GYNECOLOGY. By William P. Graves, M.D., F.A.C.S., Ed. 4. 8vo, cloth. Pp. 975, 534 illus. Phila., W. B. Saunders Co., 1928.

[2] HANDBUCH DER RÖNTGEN UND RADIUMTHERAPIE. By J. Wetterer, M.D. 8vo, cloth. Pp. 792, 192 illus. Kempton-Algaü, Otto Nemnich, 1928.

[3] THE MIND OF THE GROWING CHILD. Edited by Viscountess Erleigh. Preface by Sir James Crighton-Browne. 12 mo, cloth. Pp. 241. N. Y. Oxford University Press, American Branch, 1928.

on child welfare, under the auspices of the National Society of Day Nurseries. A sane, common-sense collection of articles, of interest to physicians with families, sure to engage the attention of the pediatrician, child welfare worker, and especially, all parents.

We echo the publishers statement that it is a "book for everyone concerned with the elementary phases of education and particularly mothers."

The reviewer's exclamation, "What, another two volume abdominal surgery," was checked when he noted on the title page, "Foreword by W. Wayne Babcock." For after all, any book with which Dr. Babcock's name is associated is worthy of more than ordinary consideration. And it is felt that no words of the reviewer can better describe Dr. Juilly's book, Practical Surgery of the Abdomen,[1] than this paragraph of Dr. Babcock's: "Perhaps you desire to perfect yourself in operative technique upon the cadaver, possibly you wish an interpretation of something seen but not clearly explained in the operating clinic, or you desire to drill yourself in operative technique or to refresh your mind before undertaking an abdominal operation; if so, you should find this book of decided help." To this the reviewer only ventures to add the expression of regret that an otherwise splendid production should display such questionable taste as to have the author's picture face the title page.

This is the third edition of a book[2] first brought out in 1920.

The author endeavors to present the salient features of modern preventive medicine. There is presented to the reader the range of this subject boiled down into the briefest number of words. It covers the entire subject and offers leads to the student interested in reviewing the endless literature on the subject.

The book is divided into sections dealing with: (1) "Diseases Due to Invading Microorganisms"; (2) "Deficiency Diseases"; (3) "Occupational Diseases"; (4) "The Puerperal State"; (5) "Heredity and Disease"; (6) "Special Aspects of Hygiene and Sanitation"; (7) "Demography"; (8) "Public Health." There is a thorough index.

Naturally, this is a worthwhile publication and is recommended to all interested in the subject.

This book[1] is made up of lectures given before the San Diego Academy of Medicine. In 1926, lecture courses were established by this body for the purpose of acquainting medical practitioners with some of the more recent advances in the fundamental medical sciences.

In this volume, dealing with chemistry, new conceptions have been formulated and new applications of established principles recently discovered, are given space. These lectures summarize present knowledge concerning certain important phases of chemistry and point out, as far as possible, the clinical applications of chemical principles.

No physician can practice modern medicine without a working knowledge of chemistry. This book fills a much needed want and may be read with profit by many physicians.

This volume[2] forms the second of a series, the purpose of which is to reprint in their original form the papers of Professor Pierre Marie.

Included in this group are: the article on the "Amytrophy" by Charcot-Marie, which appeared originally in 1886 in collaboration with Charcot; several papers on Friedrich's ataxia (l'hérédo-ataxie cérébelleuse); and many others. Altogether 48 articles are reprinted including 12 on the brain and 17 on diseases of the spine.

The publishers are to be commended for putting out this work, the value of which is self evident.

This book[3] shows that its production was a work of love. The author has written himself into it throughout and the reviewer has no hesitancy in saying that it is one of the best, if not the best, single volume textbook that is extant in English.

[1] Practical Surgery of the Abdomen. By George H. Juilly, M.D. 8vo, cloth. Pp. 1301, 1291 illus. Phila., F. A. Davis Co., 1928.

[2] Preventive Medicine. By Mark F. Boyd. 8vo, cloth. Pp. 475, 151 illus. Phila., W. B. Saunders Co., 1928.

[1] Recent Advances in Chemistry in Relation to Medical Practice. By W. McKim Marriott, B.S., M.D. 8vo, cloth. Pp. 141, 12 illus. St. Louis, The C. V. Mosby Co., 1928.

[2] Travaux et Mémoires. By Pierre Marie. Vol. II. 8vo, paper. Pp. 394, 50 illus. Paris, Masson et Cie., 1927.

[3] A Text Book of Surgery. By W. Wayne Babcock, M.D., F.A.C.S., 8vo, cloth. Pp. 1367, 1059 illus. Phila., W. B. Saunders Company, 1928.

The textbooks that have been available have not kept pace in their changes with the changes that have taken place in the teaching of surgery and this one point alone should recommend this book as an undergraduate teaching text, as, without question, this viewpoint has been in mind from the commencement of the work on the manuscript. The author has appreciated that the teaching of the undergraduate has come to a stage that information given to the undergraduate is of exactly the same class and type as the information the surgeon himself uses in the clinic. This is in accord with medical pedagogic advancement and, together with the systematic method of presentation, the balance of subject proportions, the excellent physiological as well as anatomical basis, plus the author's selective ability which is apparent throughout, argues a wide acceptance and a long life for this book.

That it will have acceptance outside the undergraduate field, we believe to be equally sure. The subjects are presented concisely and clearly; obsolete and *sub judice* material is eliminated and the author has included in a concise, readable and thoroughly acceptable form, the essential material and this means practically all of surgery, with the exception of a few specialties. The inclusion of the older anatomical nomenclature and also the B.N.A. has been a wise procedure and one which will certainly react favorably to the book.

There is no attempt in this review to go into discussions of sections or individual subjects. The book has been considered in its entirety. There are points which could be adversely criticized, but the value of this criticism, for the mass of its prospective audience, would be questionable and the favorable features so far outweigh any adverse criticism as to make such criticism qualitatively negligible.

The publishers have done much towards introducing this book favorably. The excellence of the topography is noticeable and the mechanical make-up excellent.

In this volume,[1] which forms a part of the system of general and special surgery which is being brought out by Prof. Dr. M. Kirschner, Tübingnen, and Prof. Dr. O. Nordmann, Berlin, nothing seems to have been omitted concerning the latest theories of etiology and treatment of those lesions of the skin which are likely to come under the observation of the surgeon. It is of considerable diagnostic value. Every possible borderline case between pathological conditions obviously belonging to dermatology and those of surgical nature is described from the point of view of diagnosis. The chief interest of the book to the busy surgeon is that it covers all the latest theories which have emanated from Germany within recent years in regard to surgical dermatoses. Both conservative and ultra-modern methods of treatment are considered, not in detail, but with sufficient references to make them available to those who do not have opportunity to keep in touch with current literature on the subject. The book is systematically arranged, well indexed and written in a more concise style than is customary in German medical treatises. The illustrations are excellent and the comprehensive bibliography, which is almost entirely from German authorities, is conveniently placed at the close of each chapter.

[1] Chirurgie der Haut und des Unterhautzellgewebes. Von Fr. Ascher, M.D. No. 22 (Vol. II, Pt. I, pp. 603–866). 77 illus. Berl., Urban & Schwarzenberg, 1928.

BOOKS RECEIVED

All books received by The American Journal of Surgery are listed in this column as soon as possible after their receipt and this must be considered as adequate acknowledgement. Books that the Editor considers of special interest to our readers will be reviewed in a later issue.

Blood and Urine Chemistry. By R. B. H. Gradwohl, M.D. and Ida E. Gradwohl, A.B. 8vo, cloth. Pp. 542, 121 illus. St. Louis, C. V. Mosby Co., 1928.

Chirurgische Operationslehre. By O. Kleinschmidt. Linen. Pp. 1269. Berlin, Springer, 1927.

Diseases of the Ear, Nose and Throat. By Wendell Christopher Phillips, M.D. Ed. 7. 8vo, cloth. Pp. 942, 615 illus. Phila., F. A. Davis Co., 1928.

L'Exploration Radiologique en Gynécologie. By Claude Béclère, M.D. 8vo, paper. Pp. 174, illus. Paris, Masson et Cie., 1928.

The Fundamentals of Human Motivation. By Leonard T. Troland, A.M. PH.D. 8vo, cloth. Pp. 535. N. Y., D. Van Nostrand Co., Inc., 1928.

Goiter Prevention and Thyroid Protection. By Israel Bram, M.D. 8vo, cloth. Pp. 327, 13 illus. Phila., F. A. Davis Co., 1928.

Greffe Ovarienne et Action Endocrine de l'Ovaire. By Vittorio Pettinari. 8vo, paper, Pp. 487, 181 illus. Paris, Doin et Cie.

International Clinics. Edited by H. W. Catell, M.D. Vol. III, 38th series, 1928. 8vo, cloth. Pp. 318, 296 illus. Phila., J. B. Lippincott Co., 1928.

An Introduction to Experimental Pharmacology. By Torald Sollman, M.D. and Paul J. Hanzlik, M.D. 8vo, cloth. Pp. 321, illus. Phila. and London, W. B. Saunders Co., 1928.

Recent Advances in Surgery. By W. Heneage Ogilvie, M.D. 12 mo, cloth. Pp. 468, 108 illus. Phila., P. Blakiston's Son & Co., 1928.

A Short History of Medicine. By Charles Singer, M.D. 12 mo, cloth. Pp. 392, 142 illus. New York, Oxford University Press, American Branch, 1928.

Sinus Thrombophlebitis. By Alfred Braun, M.D. Large 8vo, cloth. Pp. 283, 111 illus. N. Y., P. B. Hoeber, Inc., 1928.

Surgical Anatomy. By Grant Massie, M.S., 8vo, cloth. Pp. 421, 121 illus. Phila., Lea & Febiger, 1928.

Surgical Diagnosis in Tabular Outline. By A. J. Cemach, M.D. and L. Bortz, M.D. Large 8vo, cloth. Pp. 29, 238 illus. Phila., F. A. Davis Co., 1928.

A Text-Book of Fractures and Dislocations. By Kellogg Speed, M.D., F.A.C.S. Ed. 2. 8vo, cloth. Pp. 966, 987 illus. Phila., Lea & Febiger, 1928.

A Text-Book of Surgery. By W. Wayne Babcock, M.D., F.A.C.S. 8vo, cloth. Pp. 1367, 1041 illus. Phila., W. B. Saunders Co., 1928.

Travaux et Mémoires. By Pierre Marie. Vol. II. 8vo, paper. Pp. 392, illus. Paris, Masson et Cie., 1928.

Subscribers to The American Journal of Surgery *visiting New York City are invited to make the office of the publishers (Paul B. Hoeber, Inc., 76 Fifth Avenue, New York) their headquarters. Mail, packages or bundles may be addressed in our care. Hotel reservations will gladly be made for those advising us in advance; kindly notify us in detail as to requirements and prices. List of operations in New York hospitals on file in our office daily.*

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